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Sequence Seq

Sequence J Sequence J Sequence J Sequence

Sequence 1 Sequence 2 Sequence 2 Sequence 2 Sequence 2 Sequence 3

Perfect score: Sequence:

OM protein

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Scoring table:

Searched:

Minimum DB 8 Maximum DB 8

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Length 166;
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5514567-4
; Patent No. 5514567
; APPLICANT: SUGANO, HARUO; MURAMATSU, MASAMI; TANIGUCHI,
; TADATSUGU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 863; DB 4; 3
Pred. No. 7.3e-83;
0; Mismatches 2;
                                                    US-09-337-992A-2
US-08-819-238A-13
US-09-339-904A-86
US-09-34-002B-86
US-09-34-002B-86
US-09-206-935-17
US-08-206-936-17
US-08-249-671A-5
US-08-249-671A-11
US-08-356-021-1
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   GENERAL INNUMERATION, DAIRELL
APPLICANT: CONKIIN, DAIRELL
APPLICANT: Grant, Francis J.
APPLICANT: KINGNOGEL, WARK W.
APPLICANT: KINGNOGEL, WAYNE
TITLE OF INVENTION: Interferon-epsilon
FILE REFERENCE: 98-46
CURRENT APPLICATION NUMBER: US/09/397,992A
CURRENT FILING DATE: 1999-09-18
PRIOR FILING DATE: 1998-09-18
PRIOR FILING DATE: 1999-02-05
PRIOR FILING DATE: 1999-07-08
PRIOR FILING DATE: 1999-07-08
PRIOR FILING DATE: 1999-07-08
PRIOR FILING DATE: 1999-07-08
SPRIOR FILING DATE: 1999-07-08
SOFTWARE: FASTEQ for Windows Version 3.0
SEQ ID NO 7
FEMALTH. 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ALIGNMENTS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Sequence 7, Application US/09397992A Patent No. 6329175
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US-09-397-992A-7
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Best Local Simi
Matches 164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                US-09-397-992A-7
121
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Sequence 30, Appli
Sequence 7, Appli
Sequence 7, Appli
Patent No. 5514567
Sequence 1, Appli
Sequence 1, Appli
Sequence 1, Appli
Sequence 2, Appli
Sequence 3, Appli
Sequence 2, Appli
Sequence 3, Appli
Sequence 1, Sppli
Sequence 3, Appli
Sequence 1, Sppli
Sequence 3, Appli
Sequence 3, Appli
Sequence 1, Sppli
Sequence 3, Appli
                                                                                                                                                                                            July 29, 2002, 15:43:21; Search time 20.72 Seconds (without alignments) 195.688 Million cell updates/sec
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                                                                                                                                                                                                                                                                                                       SEQ2-49N-51T
875
1 MSYNLLGFLQRSSNFQCQKL.....RVEILRNFYFINRLTGYLRN 166
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Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              US-09-397-992A-7
5514567-4
US-08-406-903A-9
US-08-406-935-7
US-09-206-935-7
US-09-206-935-7
US-08-213-48-1
US-08-912-768-1
US-08-912-768-1
US-08-912-768-1
US-08-912-768-1
US-08-912-768-2
5326859-1
US-08-026-758-22
US-08-026-758-25
US-09-397-992A-26
US-09-397-992A-26
US-09-397-992A-26
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           231628 segs, 24425594 residues
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Maximum Match 100%
Listing first 45 summaries

    protein search, using sw model

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Gapop 10.0 , Gapext 0.5
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Match 1
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Gaps

9

Score

Result No.

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Sequence 30, Application US/08406030A
Patent No. 6270989
GENERAL INFORMATION:
APPLICANT: Treco, Douglas A.
APPLICANT: Heartlein, Michael W.
APPLICANT: Heartlein, Michael W.
APPLICANT: Belden, Richard F
TITE OF INVENTION: Protein Production and Delivery
NUMBER OF SEQUENCES: 30
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                        ADDRESSEE: Hamilton, Brook, Smith & Reynolds, P.C.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Patentin Release #1.0, Version #1.30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRIOR APPLICATION DATA:

APPLICATION NUMBER: US 08/243;391

PRIOR APPLICATION NUMBER: US 08/243;391

PRIOR APPLICATION NUMBER: US 07/985,586

FILING DATE: 03-DEC-1992

APPLICATION NUMBER: US 07/911,533

PRIOR APPLICATION NUMBER: US 07/911,533

PRIOR APPLICATION NUMBER: US 07/911,533

PRIOR APPLICATION NUMBER: US 07/787,840

FILING DATE: 05-NOV-1991

APPLICATION NUMBER: US 07/789,188

FILING DATE: 05-NOV-1991

APPLICATION NUMBER: US 07/789,188

FILING DATE: 05-NOV-1991

PRIOR APPLICATION DATA:
APPLICATION NUMBER: US 07/789,188

FILING DATE: 05-NOV-1991

PRIOR APPLICATION NUMBER: PCT/US93/11704
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       APPLICATION NUMBER: US/08/406,030A FILING DATE: 17-MAR-1995
                                                                                                                                                                                                                                                                                                                                                                                    COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0,
                                                                                                                                                                                                                                                                             Two Militia Drive
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                        Massachusetts
                                                                                                                                                                                                                                                                             STREET: Two Mil.
CITY: Lexington
STATE: Massachus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              FILING DATE: 17 CLASSIFICATION:
                                                                                                                                                                                                                                                                                                                                                               02173
         US-08-406-030A-30
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        US-08-406-030A-30
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Pred. No. 7.3e-83;
0; Mismatches 2; Indels
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          TITLE OF INVENTION: DNA AND RECOMBINANT PLASMID NUMBER OF SEQUENCES: 5
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/400,179
FILING DATE: 06-MAR-1995
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 389,922
FILING DATE: 18-JUN-1982
APPLICATION NUMBER: 201,359
FILING DATE: 27-OCT-1980
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              APPLICANT: Chen, Jian
APPLICANT: Godowski, Paul J.
APPLICANT: Godowski, Paul J.
APPLICANT: Wood, William I.
APPLICANT: Wood, William I.
APPLICANT: Anny, Dong-Xiao
TITLE OF INVENTION: NOVEL TYPE I INTERFERONS
FILE REFERENCE: P1224-2R1
CURRENT APPLICATION NUMBER: US/09/206,903A
PRIOR APPLICATION NUMBER: US 60/106,463
PRIOR FILING DATE: 1998-10-30
NUMBER OF SEO ID NOS: 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence 9, Application US/09206903A Patent No. 6200780
                                                                                                                                                                                                                                                                                                                                      98.68;
98.88;
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Best Local Similarity 98.8
Matches 164; Conservative
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US-09-206-903A-9
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                                                                                                                                                                                                                                                 LENGTH: 166
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LENGTH: 18
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     98.6%; Score 863; DB 4; Length 187; 98.8%; Pred. No. 8.5e-83; 1ve 0; Mismatches 2; Indels
PRICE APPLICATION DATA
APPLICATION NUMBER: PCT/US92/09627
FILING DATE: 05-NOV-1992
ATTORNEY/AGENT INFORMATION:
                                                                                                NAME: Granahan, Patricia
REGISTRATION NUMBER: 32,227
REFERENCE/DOCKET NUMBER: TKT
TELECOMMUNICATION:
TELEPHONE: (617) 861-6240
                                                                                                                                                                                                                     TELEFAX: (617) 861-9540
INFORMATION FOR SEQ ID NO: 30:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                : 187 amino acids
amino acid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match 98.6
Best Local Similarity 98.8
Matches 164; Conservative
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61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
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                                                                                                                                                                                 82 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKKEKFKKLAKSSL 141
                                                                                                                                                        EMLONIFAIFRODSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                      1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY 60
                                                                             22 MSYNLLGFLQRSSNFQCQKLLMQLNGRLEYCLKDRMNFDIPEEIKQLQQFQKEDAALTIY 81
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Length 187;
                                                                                                                                                                                                                                                       121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                 142 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 187
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; APPLICANT: SUGANO, HARUO; MURAMATSU, MASAMI; TANIGUCHI,
;TADATSUGU
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 863; DB 4; I
Pred. No. 8.5e-83;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      TITLE OF INVENTION: DNA AND RECOMBINANT PLASMID
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             GENERAL INFORMATION:
APPLICANT: Chen, Jian
APPLICANT: WOOG, William I.
TITLE OF INVENTION: No. 6300475el Inteferon
FILE REFERENCE: P1224R1
CURRENT APPLICATION NUMBER: US/09/206,936A
CURRENT FILING DATE: 1998-12-07
EARLIER RILING DATE: 1998-12-08
NUMBER OF SEQ ID NOS: 22
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               0; Mismatches
     Mismatches
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CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/400,179
FILING DATE: 06-MAR-1995
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 389,922
FILING DATE: 18-JUN-1982
APPLICATION NUMBER: 201,359
FILING DATE: 27-OCT-1980
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98.88;
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Best Local Similarity 98.8
Matches 164; Conservative
     Conservative
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5514567-1
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US-09-206-936-7
     Matches 164;
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82 EMLONIFAIFRODSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 141
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       22 MSYNLLGFLQRSSNFQCQKLLMQLNGRLEYCLKDRMNFDIPEEIKQLQQFQKEDAALTIY 81
                                                                                                                                                                                                                                                                      GENERAL INFORMATION:
APPLICANT: Chen, Jian
APPLICANT: Godowski, Paul
APPLICANT: Godowski, Paul
APPLICANT: Wood, William I.
APPLICANT: Wood, William I.
APPLICANT: Zhang, Dong-Xiao
TITLE OF INVENTION: HUMAN INTERPERON-EPSILON: A TYPE I INTERFERON
CURRENT APPLICATION NUMBER: US/09/202,122
CURRENT FILING DATE: 1999-03-04
PRIOR FILIAGICATION NUMBER: PCT/US98/25672
PRIOR FILIAGICATION NUMBER: PCT/US98/25672
NUMBER OF SEQ ID NOS: 12
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 863; DB 4; Length 187; Pred. No. 8.5e-83;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Score 863; DB 4; Length 18
Pred. No. 8.5e-83;
0; Mismatches 2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
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                                                                             142 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLIGYLRN 187
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Sequence 7, Application US/09206935
Sequence 7, Application US/09206935
Sequence No. 629877
Sequence No. 629877
Sequence No. 31an
APPLICANT: Godowski, Paul
APPLICANT: Wood, William I.
APPLICANT: Zhang, Dong-xiao
TITLE OF INVENTION: NOVEL TYPE I INTERFERONS
FILE REPERENCE: 11669.50USO5
CURRENT APPLICATION NUMBER: 0S/09/206,935
CURRENT FILING DATE: 1998-12.07
EARLIER APPLICATION NUMBER: 60/084,045
SAPRAMRE: PATENT NOVE: 24
NUMBER OF SEQ ID NOS: 24
SOFTWARE: PatentIn Ver. 2.0
                                                                                                                                                                                                                           Sequence 9, Application US/09202122
Patent No. 6299869
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         98.68;
98.88;
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98.8%;
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US-09-202-122-9
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Query Match
Best Local Similarity
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Best Local Similarity
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121 HLKRYYGRICHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
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                                                                                                                                                                                  82 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 141
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                                                                             1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY 60
                                                                                                    22 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQQFQKEDAALTIY 81
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0
    Length 187;
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                                                                                                                                                                                                                                                                                                                                                                        Sequence 1, Application US/08477310A
Patent No. 5814485
GENERAL INFORMATION:
GENERAL INFORMATION:
APPLICANT: MCAlary, Patrick J.
APPLICANT: Wong, Kathleen M.
TITLE OF INVENTION: Bacterial Production of Hydrophobic
TITLE OF INVENTION: Polypeptides
NUMBER OF SEQUENCES: 3
CORRESPONDENCE ADDRESS:
ADDRESSE: Chiron Corporation
                                        2; Indels
                                                                                                                                                                                                                                         121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                            142 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 187
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COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PATCHILIN Release #1.0, Version #1.30
CURRENT APPLICATION DATA:
Score 863; DB 6;
Pred. No. 8.5e-83;
0; Mismatches 2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        ATTORNEY AGENT INFORMATION:
NAME: Chung, Ling-Fong
REGISTRATION NUMBER: 36,482
REFERENCE/DOCKET NUMBER: 960.001
TELECOMMUNICATION INFORMATION:
TELEFAN: ($10) 655-3542
INFORMATION FOR SEQ ID NO: 1:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  APPLICATION NUMBER: US/08/477,310A FILING DATE: 06-JUN-1995 CLASSIFICATION: 435
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               4560 Horton Street
98.6%;
98.8%;
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                                      Matches 164; Conservative
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Matches 163; Conservative
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Query Match
Best Local Similarity
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61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
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121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
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                                                                                                                         Sequence 1, Application US/08213448

Patent No. 5545723

GENERAL INFORMATION:
APPLICANT: Goelz, Susan E
APPLICANT: Cate, Richard L
APPLICANT: Peptinsky, Blake R
APPLICANT: Chow, Pingchang E
TITLE OF INFORTION: No. 5545723el Muteins Of IFN-Beta
                                                                                                                                                                                                                                                                                                                                                                            Americas
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SOFTWARE: Patentin Release #1.0, Version #1.25 CURRENT APPLICATION DATA: APPLICATION NUMBER: US/08/213,448 FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        98.1%; Score 858; DB 1; Le
98.2%; Pred. No. 2.4e-82;
"Mismatches 3;
                                                                                                                                                                                                                                                                                                                                                                          of the
                                                                                                                                                                                                                                                                                                                                                 ADDRESSEE: James F. Haley, Jr.
STREET: Fish & Neave, 1251 Avenue
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   CLASSIFICATION: 424
ATTORNEY/AGENT INFORMATION:
NAME: HALEY JT., James F
REGISTRATION NUMBER: 27,794
REFERENCE/DOCKET, NUMBER: B179
TELECOMMUNICATION INFORMATION:
TELECHONE: (212) 596-9000
TELEFAX: (212) 596-9000
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
OPERATING SYSTEM: PC-DOS/MS-DOS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      RESULT 11
US-08-212-768-1
; Sequence 1, Application US/08912768
; Patent No. 6127332
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    amino acid
                                                                                                                                                                                                                                                                                                                                                                                            CITY: New York
STATE: New York
COUNTRY: USA
                                                                                                                                                                                                                                                                                                                                                                                                                    New York
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STRANDEDNESS:
TOPOLOGY: line
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                                                                                                       US-08-213-448-1
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COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: IBM PC compatible
STREET: Fish & Neave, 1251, STREET: Americas
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Best Local Similarity 98.2
Matches 163; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  TYPE: amino acid
STRANDEDNESS: single
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MOLECULE TYPE: protein HYPOTHETICAL: NO
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STATE: Ne.
COUNTRY: USA
TO 10020-1104
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                                                                   New York
New York
                                                                                   STATE: New York
COUNTRY: USA
ZIP: 10020-1104
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                                                                                                                                                                                                                                                                                   FILING DATE
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US-08-912-768-3
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTFLEEKLEKEDFTRGKLMSSL 120
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Length 166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     3; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
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                                         APPLICANT: Pepinsky, Blake R
APPLICANT: Chow, Pingchang E
TITLE OF INVENTION: No. 6127332el Muteins Of IFN-Beta
NUMBER OF SEQUENCES: 5
                                                                                                                                     ADDRESSEE: James F. Haley, Jr.
STREET: Flah & Neave, 1251 Avenue of the Americas
CITY: New York
STATE: New York
                                                                                                                                                                                                            STATE: NEW TOTA
COUNTY: USA
ZIP: 10020-1104
ZOMPUTER REABALE FORM:
MEDIUM RYPE: Floppy disk
COMPUTER: IBM PC COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: PATENTIN Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Score 858; DB 3;
Pred. No. 2.4e-82;
0; Mismatches 3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                APPLICANT: Biogen, Inc.
APPLICANT: Goelz, Susan E
APPLICANT: Cate, Richard L
APPLICANT: Pepinsky, Blake R
APPLICANT: Chow, Pingchang E
TITLE OF INVENTION: Novel Muteins Of IFN-Beta
CORRESPONDENCE ADDRESS: 4
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GENERAL INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                           CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/475,774
FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      ATTORNEY/AGENT INFORMATION:
NAME: Haley Jr., James F
REGISTATION UNDRER: 27, 79
REFERENCE/DOCKET NUMBER: B179
TELECOMMUNICATION INFORMATION:
TELEFANE: (212) 596-9000
TELEFAX: (212) 596-9000
INFORMATION FOR SEQ ID NO: 1:
SEQUENCE CHARACTERISTICS:
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98.2%;
         Goelz, Susan E
Cate, Richard L
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TYPE: amino acid
STRANDEDNESS: single
TOPOLOGY: linear
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Best Local Similarity 98.2°
Matches 163; Conservative
                                                                                                     NUMBER OF SEQUENCES: 5
CORRESPONDENCE ADDRESS:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                                                                                                                                               FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ; ANTI-SENSE:
US-08-912-768-1
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PCT-US95-03206-1
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61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              98.1%; Score 858; DB 5; Length 166; 98.2%; Pred. No. 2.4e-82; ive 0; Mismatches 3; Indels
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APPLICANT: Goelz, Susan E
APPLICANT: Cate, Richard L
APPLICANT: Pepinsky, Blake R
APPLICANT: Chow, Pingchang E
TITLE OF INVENTION: No. 6127332el Muteins Of IFN-Beta
NUMBER OF SEQUENCES: 5
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ADDRESSE: James F. Haley, Jr.
STREET: Fish & Neave, 1251 Avenue of the Americas CITY: New York
                                                                                                                                  SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: PCT/US95/03206
                                                                                                               PC-DOS/MS-DOS
                                                                                                                                                                                                                                    CLASSIFICATION:
ATTORNEY/AGENT INFORMATION:
NAME: Haley Jr., James F
REGISTRATION UNBER: 27,794
REFERENCE/POCKET NUMBER: B179
TELECOMMUNICATION INFORMATION:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 3, Application US/08912768
Patent No. 6127332
ZIP: 1002U-112-
COMPUTER READABLE FORM:
MEDIUM TYPE: Floppy disk
COMPUTER: FIBM PC COMPALIALE
PC-DOS/MS-
                                                                                                                                                                                                                                                                                                                                                                                                 TELEPHONE: (212) 596-9000
TELEFAX: (212) 596-9090
INFORMATION FOR SEO ID NO: 1:
SEQUENCE CHARACTERISTICS:
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SEQ ID NO:1
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| Sequence 22, Application US/08026758
| Patent No. 5780021
| GENERAL INFORMATION:
| APPLICAMT: SOBEL, DOUGLAS O. TITLE OF INVENTION: DISEASES USING ALPHA-INTERFERON AND/OR BETA-INTERFERON NUMBER OF SEQUENCES: 26
| CORRESPONDENCE ADDRESS: ADDRESSE: P.C. SPIVAK, MCCLELLAND, MAIER & NEUSTADT, ADDRESSE: P.C. STREET: 1755 S. Jefferson Davis Highway, Suite 400
| CITY: Arlington | Commence of the commence of the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ö
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MEDIUM TYPE: Floppy disk
COMPUTER: IBM COMPATIBLE
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/08/026,758
FILING DATE: 19930305
CLASSIFICATION: 424
ATTORNEY/AGENT INFORMATION:
NAME: Obion, No. 5780021man F.
REFERENCE/POCKET NUMBER: 126-096-0'
TELECOMMUNICATION INFORMATION:
OPERATING SYSTEM: PC-DOS/MS-DOS
SOFTWARE: Patentin Release #1.0, Version #1.25
CURRENT APPLICATION DATA:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 858; DB 3;
Pred. No. 2.8e-82;
0; Mismatches 3.
                                                                                                              APPLICATION NUMBER: US/08/912,768
                                                                                                                                                                                                                                                                                                                                ATTORNEY/AGENT INFORMATION:
NAME: Haley Jr., James F
REGISTRATION NUMBER: 27,794
REFERENCE/DOCKET NUMBER: B179
TELECOMMUNICATION INFORMATION:
TELEPHONE: (212) 596-9000
TELEPHONE (212) 596-9000
INFORMATION FOR SEQ ID NO: 3:
SEQUENCE CHARACTERISTICS:
                                                                                                                                                 FILING DATE:
CLASSIFICATION:
PRIOR APPLICATION DATA:
APPLICATION NUMBER: 08/475,774
FILING DATE:
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        98.1%;
98.2%;
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Matches 163; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          APPLICANT: Sugano, Haruo; Muramatsu, Masami; Taniguchi, Tadatsugu TITLE OF INVENTION: DNA AND RECOMNINANT PLASMID NUMBER OF SEQUENCES: 3
CURRENT APPLICATION DATA:
APPLICATION NUMBER: US/06/201,359
FILING DATE: 27-0CT-1980
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                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 187;
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                                                                                                                                                                                                                                                                                                                                                                                                                                               Ouery Match 97.7%; Score 855; DB 1; Best Local Similarity 98.2%; Pred. No. 5.9e-82; Matches 163; Conservative 0; Mismatches 3
                                                                                                                                                                                                                                                                                                                                     /note= "Hu-IFN-beta"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Search completed: July 29, 2002, 15:43:22 Job time: 223 sec
TELEPHONE: (703) 413-3000
TELEFAX: (703) 413-220
TELEX: 248855 OPAT UR
INFORMATION FOR SEQ ID NO: 22:
SEQUENCE CHARACTERISTICS:
LENGTH: 187 amino acids
                                                                                                                                                                                               TOPOLOGY: unknown
MOLECULE TYPE: protein
                                                                                                                                                                                                                                                                               ; NAME/KEY: Protein
; LOCATION: 22..187
; OTHER INFORMATION:
US-08-026-758-22
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5326859-1
;Patent No. 5326859
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Human interferon b
Human interferon b
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Sequence between t
Human interferon b

Interferon-beta ge Human interferon b Human interferon b Human interferon b

Human interferon b Modified human int IFN-beta(Phel01). Human interferon b

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Sequence of beta-1
Amino acid sequenc Histidine tagged-h Sequence of fibrob Human fibroblast 1 Human fibroblast 1 Human fibroblast 1 Human hereferon b Human beta-interfe

Human INF-beta A-c Human INF-beta B-c

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Human; interferon beta; antibody; multiple sclerosis; gene therapy; viral infection; viral hepatitis; cancer; breast cancer; inflammation; Crohn's disease; acute myeloid leukaemia; Hodgkin's disease; ulcerative colitis; immunomodulation; mutant; muten; Q49N/Q51T.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               /note= "Wild-type Gln replaced with Asn"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 /note= "Wild-type Gln replaced
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                                             AAP50261
AAX4086
AAY10016
AAY10016
AAP20026
AAP10016
AAX65380
AAU00150
AAU000072
AAU000085
AAU000085
AAU00160
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AAU00070
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99US-0160782.
99DK-0001691.
2000DK-0000194.
2000DK-0000363.
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Misc-difference 49
Misc-difference
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21-OCT-1999;
26-NOV-1999;
07-FEB-2000;
07-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   16-MAY-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                08-MAR-2001
\begin{array}{c} \mathbf{0} \\ \mathbf{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   AAU00119;
RESULT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Human interferon b
Sequence of interf
Sequence encoded b
Protein sequence e
Oxidation resistan
Sequence of interf
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Mature human beta-
Human wild-type in
Human interferon b
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1. \Cside State 1. \text{A.cateseq_1.9280.r.*}
1. \Side State 1. \text{A.cateseq_1.9280.r.*}
2. \Side State 1. \text{All d.geneseq_1/geneseqp_-embl_AAl980.dar.*}
3. \Side State 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
4. \Side State 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
4. \Side State 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
5. \Side 1. \Side 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
6. \Side 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
7. \Side 1. \Side 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
8. \Side 1. \Side 1. \Side 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
9. \Side 1. \Side 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
9. \Side 1. \Side 1. \Side 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
9. \Side 1. \Side 1. \Side 1. \text{All d.geneseq_1/geneseqp_-embl_AAl981.dar.*}
9. \Side 1. \Side 1. \text{All d.geneseq_1/geneseqp_-embl_AAl991.dar.*}
9. 
                                                                                                                                                           July 29, 2002, 15:39:04; Search time 51.64 Seconds (without alignments) 357.054 Million cell updates/sec
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Human native inter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                                                                          SEQ2-49N-51S
874
1 MSYNLLGFLQRSSNFQCQKL......RVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            /SIDS1/gcgdata/hold-geneseq/geneseqp-embl/AA2001.DAT
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Description
                    GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                                                                                                                                                                    747574 segs, 111073796 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAE11979
AAU00038
AAU00074
                                                                                                                     OM protein - protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAP30219
AAP50262
AAP50279
AAP61071
AAP70296
AAW81774
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAU00119
                                                                                                                                                                                                                                                                                                                                                              BLOSUM62
Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A_Geneseq_032802:*
1: /SIDS1/qcqdata/
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      length: 0
length: 2000000000
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22222
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 166
1166
1166
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1166
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Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              seq
                                                                                                                                                                                                                                                                                          Perfect score:
                                                                                                                                                                                                                                                                                                                                                                 Scoring table:
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Minimum DB Maximum DB

Searched:

:eouenbes

on:

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Database

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Homo sapiens.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           à
                                                                                                                                                                                                               Conjugates of the invention exhibiting interferon beta activity comprise at least one first non-polypeptide group covalently attached to an interferon beta polypeptide, the amino acid sequence of which differs from wild-type human interferon beta in at least one introduced and at least one removed amino acid residue comprising an attachment of group for the first non-polypeptide group. The invention also concerns reducing the immunogenicity and/or increasing function also concerns reducing the immunogenicity and/or increasing functional in vivo half-life and/or serum half-life of an interferon beta polypeptide comprising an attachment group for a first non-polypeptide group into a position exposed at the surface of the protein that does not contain such a group and removing comprising in amino acid residue constituting an attachment group for a first non-polypeptide group into a position exposed at the surface of the protein that does not contain such a group and removing constituting an attachment group for a first non-polypeptide group. The conjugate and a cell culture corpressing the mutated prolypeptides are useful in the treatment of disease, especially multiple sclerosis, and for treating mammals having circulating antibodies against interferon beta la or 1b. DNA encoding the mutated proteins may be used for gene therapy. The DNA and proteins can also be used to treat viral infections (e.g. viral hepatitis), cancer (e.g. breast cancer), inflammation, crohn's disease, acute myeloid inmunomedules.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFSKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Note: The present sequence is not shown in the specification but is derived from the human interferon beta sequence given in AAU00038.
                                                                                                                 conjugate exhibiting interferon beta activity useful for treating
                                                           Rasmussen PB;
                                                                                                                               multiple sclerosis comprises a non-polypeptide group covalently attached to an interferon beta polypeptide -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         ö
                                                                                                                                                                                                         sequence represents Human interferon beta mutant Q49N/Q51T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 870; DB 22; Length 166;
Pred. No. 4.4e-68;
0; Mismatches 1; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence of interferon (HuIFN) -beta-1 encoded by plasmid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Hybrid interferon; antiviral; therapy; cancer; tumour.
                                                           Bornaes C,
                                                          Andersen KV,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAP30219 standard; Protein; 166 AA
                                                                                                                                                                            Claim 39; Page - ; 108pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          99.5%;
99.4%;
14-APR-2000; 2000DK-0000642
                                                       Pedersen AH, Schambye HT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      25-MAY-1992 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Query Match
Best Local Similarity 99.4
Matches 165; Conservative
                                                                                      WPI; 2001-218488/22.
                             (MAXY-) MAXYGEN APS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Lmmunomodulation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 pDM101/trp/beta-1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sedneuce
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       AAP30219;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             61
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The inventors claim a multiclass hybrid interferon polypeptide and a bar unit having a nuclectide sequence which encodes it. Pref. the DNA unit having a nuclectide sequence which encodes it. Pref. the AA sequence consists of alpha and beta interferons. Pref. Irl is (i) the 1-73 AA seq. of Hurkn-alpha-1 (and Ir2 is the 74-166 AA seq. of Hurkn-alpha-61A (and Ir2 is the 43-166 AA seq. of Hurkn-beta-1) (see AAN30155, AAR30222); or (ii) the 1-41 AA seq. of Hurkn-alpha-61A (and Ir2 is the 43-166 AA seq. of Hurkn-beta-1) (see AAN30160, AAR3027). Alternatively Irl is the amino terminal end of a beta-Ir and Irl is the amino terminal end of a crosp.) (see AAN30156, AAR30223). In the examples plasmids pGWS and pDM101/trp/beta-1 and p-alpha-61A were used (see AAN30151, AAN30152, AAN30157). HinfI was used to digest the DNA sequences in the region of significant handicaps (see AAN30153, AAN30158, AAN30159), and the restriction fragments were ligated to form hybrid DNA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnF8KEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Multi:class hybrid interferon poly:peptide(s) - with restricted antiviral and cell growth regulatory activities
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Sequence encoded by the sequence between the EcoRI site and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Expression vector; trp promoter-operator; transformed bacteria.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Length 166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 864; DB 4; Length Lure Pred. No. 1.5e-67; 2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAP50262 standard; Protein; 166 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Example; Fig 5; 61pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      98.98;
                                                                                                                                                                 83US-0340782.
83US-0463574.
85US-0755265.
                                                                                                                83WO-0900607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      XhoII site of p-beta-l-trp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                   Creasey AA;
                                                                                                                                                                                                                                                                                                                                                                                             WPI; 1983-723186/30.
                                                                                                                                                                                                                                                                               (CETU-) CETUS CORP.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                       N-PSDB; AAN30152
                                                                                                                18-JAN-1983;
                                                                                                                                                                                              03-FEB-1983;
15-JUL-1985;
                                                                                                                                                                       19-JAN-1982;
WO8302461-A.
                                                      21-JUL-1983
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  20-NOV-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Matches 164;
                                                                                                                                                                                                                                                                                                                                   Mark DF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAP50262;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Query Match
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EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                       The sequence encodes a synthetic interferon-beta which has increased biological activity compared to natural IRN-beta, and which is more effective in the treatment of viral or neoplastic diseases, or immunosuppressed or immunodeficient conditions.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            or absent"
                                                                                                                                                                                                                                                                                                                         98.9%; Score 864; DB 6; Length 166; 98.8%; Pred. No. 1.5e-67; 1.ve 0; Mismatches 2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            IL-2; IFN-Beta; colony stimulating factor; CSF-1; tPA;
                                                                                                                         antiviral,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference 1..6
/note= "May be N-terminal truncated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         'note= "May be any conservative AA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "May be any conservative AA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "May be any conservative AA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       /note= "May be any conservative AA"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Oxidation resistant mutein of Interferon-Beta.
                                                                                                                     modified beta-interferon(s) - useful as a 1-neoplastic and immuno-modulatory agents.
                                              Ξ
                                              Houghton
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Location/Qualifiers
                                                                                                                                                                     Disclosure; Fig 20; 96pp; English.
                                            Smith JC,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAP61071 standard; Protein; 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          85US-0810656.
85US-0692596.
86AU-0064846.
86US-0893186.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              86AU-0052451
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (first entry)
                                                                                                                                                                                                                                                                                                                                                         Conservative
            (SEAR ) SEARLE G D & CO.
                                            Boseley PG,
                                                                                                                                     anti-neoplastic and
                                                                         WPI; 1985-020165/04
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Misc-difference 117
                                                                                                                                                                                                                                                                                                                                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Misc-difference 36
                                                                                                                                                                                                                                                                              166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Misc-difference 17
                                                                                         N-PSDB; AAN50306
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18-JAN-1985;
05-NOV-1986;
05-AUG-1986;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              17-JAN-1986;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   28-MAY-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AU8652451-A
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                31-JUL-1986
                                                                                                                                                                                                                                                                                                                                         Best_Local Sim
Matches 164;
                                                                                                                                                                                                                                                                              Sequence
                                           Bell LD,
                                                                                                                                                                                                                                                                                                                             Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                    61
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                                                                                                                                                                                                                                                                                                                                                                                                                    셤
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMLQNIFALFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The inventors claim a process for the prodn. of heterologous polypeptide by transformed bacteria. The pref. promoter-operator is try which controls expression of structural genes encoding polypeptides of a synthetic pathway forming tryptophan, esp. at a concn. of 5.3T mg/l (T* predetermined turbidity value measured at 680nm, esp. 10-100). The transformed bacteria are esp. E.coli contg. the plasmid p-beta-l-trp. Example 1 concerns the construction of plasmid p-beta-l-trp for the direct expression of IFN-beta under the control of trp promoter-operator.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ö
                                                                                                                                                                                                                                              Polypeptide, esp. interferon, prodn. by transformed bacteria cultured in presence of a repressor which is consumed during
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 864; DB 6; Length 166;
Pred. No. 1.5e-67;
0; Mismatches 2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Protein sequence encoding synthetic interferon-beta gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Interferon-beta; virucide; antitumor; immunostimulant,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Æ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAP50279 standard; protein; 166
                                                                                                                                                                                                                                                                                                         Example; Fig 5; 12pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        98.98;
98.88;
                                                                       82US-0375098
84CA-0445883
                                           82US-0375098
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Conservative
                                                                                                                                                                    Konrad MW, Mark DF;
                                                                                                                                                                                                WPI; 1985-055962/09.
N-PSDB; AAN50289.
                                                                                                                    (CETU-) CETUS CORP
(CETU ) CETUS CORP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            166 AA;
                                                                       05-MAY-1982;
23-JAN-1984;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        28-JUN-1984;
                                           05-MAY-1982;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  09-DEC-1991
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           12-FEB-1985
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     164;
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Best Local Si
Matches 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Seguence
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AAW81774;
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                                                                                                                                                                                                                                       EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                             Gaps
                                                                                                                                                                                                      1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                                                                             The inventors claim an interferon conjugate wherein a C-terminal of
                                                                                        Modified peptide has residues susceptable to chloramine T and peroxide oxidation replaced with conservative AAs. Mutein is thus resistant to oxidisation. Other proteins which may be similarly rendered resistant include tissue plasminogen activator, colony stimulating factor and human growth factor.

    useful as antivirals

                                                                                                                                                                                  0;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Conjugates of interferon(s)-beta and-gamma - useful as antivir, and anti-cell proliferatives with broader spectrum of activity and obtd. economically by recombinant DNA procedures
                                                                                                                                                                     Length 166;
                                                 Oxidn. resistant mutein(s) - prepd. by replacing oxidn.-susceptible methionine with conservative aminoacid
                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                      HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                               12 hlkryygrilhylkakeyshcawtivrveilrnfyfinrltgylrn 166
                                                                                                                                                                   Score 864; DB 7; I
Pred. No. 1.5e-67;
); Mismatches 2;
                MA;
                                                                                                                                                                                                                                                                                                                                                                                                   Antiviral; antiproliferative agent.
                                                                                                                                                                                                                                                                                                                                  Ş
                Innis
                                                                         Claim 5; Page 50; 50pp; English.
                                                                                                                                                                                                                                                                                                                                  standard; protein; 166
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                                                                                                                                                                   98.98;
98.88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sawada
                                                                                                                                                                                                                                                                                                                                                                                  Sequence of interferon-beta
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     87EP-0103406
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86JP-0308693
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 7; p35; 52pp; English
                                                                                                                                                                                                                                                                                                                                                                  (first entry)
                                                                                                                                                                           Similarity 98.8
                RF,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (TORA ) TORAY IND INC.
                Halenbeck
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Tanaka T, Kawano G,
                               WPI; 1986-239075/37
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 1987-258309/37
(CETU ) CETUS CORP.
                                                                                                                                            Ź
                                                                                                                                            166
                                                                                                                                                                                                                                                                                                                                                                                                                    Homo sapiens
                                                                                                                                                                   Query Match
Best Local Simi
Matches 164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                    10-MAR-1987;
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26-DEC-1986;
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                                                                                                                                                                                                                                                                                                                                                                                                                                   EP237019-A.
               Koths KE,
                                                                                                                                            Sequence
                                                                                                                                                                                                                                                                                                                                 AAP70296
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                                                Oxidn.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     9
                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                    Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            hydroxylic amino acid substitutions to improve water solubility used e.g. in in vitro screening assays, to measure interferon levels and to treat multiple sclerosis
the region exhibiting biological activities of interferon-beta has been linked to an N-terminal of the region exhibiting biological activities of interferon-gamma. The antiviral activity of the conjugate was tested using FL cells-sindbis virus system according to the CPE 50 inhibition method. Antiviral activity ranged from
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Interferon-Beta; variant; human; medicament; treatment; screening; multiple sclerosis; measurement; water soluble.
                                                                                                                                                                                                                                                                                                                                                                                                      1 MSYNLLGFLORSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFSKEDAALTIY
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                                                                                                                                                                                                                                                                                             Length 166;
                                                                                                                                                                                                                                                                                                                                                 Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                       Score 864; DB 8; Lo
Pred. No. 1.5e-67;
); Mismatches 2;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Waschuetza
                                                                                                                                                                                                                                                                                                                                               0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Human native interferon-beta protein.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Æ
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAW81774 standard; protein; 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Schneider-Fresenius C,
                                                                                                                                                                                                                                                                                          98.9%;
98.8%;
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                                                                                                                                                                                                                                                                                    Query Match
Best Local Similarity 98.8
Matches 164; Conservative
                                                                                                                                           200 U/ml to 18500 U/ml
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           WPI; 1998-569784/49
                                                                                                                                                                                                      166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      166 AA;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      23-APR-1997;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             23-APR-1997;
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18-DEC-2001
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                                                                                                                                                                                                                                                                           AAE11979;
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Query Match
Best Local
                                                                                                      61
                                                                                                                                                                                 121
                          Matches
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                                                                                                                                                                                                                                                                                                                                                                  Human; beta-interferon; INF-beta; immune disease; demyelinating disease;
sub-acute sclerosing panencephalomyelitis; SSPE; multiple sclerosis;
metachromatic leukodystrophy; Guillain-Barre syndrome;
                                                                                                                  EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                               Gaps
                                                                9
                                                                                        9
                                                                            1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFSKEDAALTIY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Use of nucleic acid for the treatment of immune diseases such as \operatorname{multiple} sclerosis -
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      The invention relates to use of nucleic acids expressing human
             Length 166;
                                       Indels
                                                                                                                                                                                   121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
          Score 864; DB 19;
Pred. No. 1.5e-67;
0; Mismatches 2;
                                       0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                            Location/Qualiflers
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                                                                                                                                                                                                                                                             AAE10346 standard; Protein; 166
                                                                                                                                                                                                                                                                                                                                         human beta-interferon
            98.9%;
98.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         2000EP-0440053
2000US-0246089
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 20-FEB-2001; 2001EP-0103580
                                                                                                                                                                                                                                                                                                                (first entry)
                                       Matches 164; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                          autoimmune disease.
                         Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (TRGE ) TRANSGENE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     166 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               N-PSDB; AAD17506
                                                                                                                                                                                                                                                                                                                                                                                                                                  sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EP1133997-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23-FEB-2000;
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                                                                                                                                                                                                                                                                                                                10-DEC-2001
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                                                                                                                                                                                                                                                                                      AAE10346;
             Query Match
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                            Local
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Dispersions of particles for administration to the lung and circulatory system by inhalation, e.g. from a nebulizer -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Human; interferon-gamma; IFNG; interferon-beta; interferon alpha; FSH; follicle stimulating hormone; granulocyte colony stimulating factor; G-CSF; interleukin 10; IL-10; medicament; pulmonary administration; circulatory administration.
                                                                                                                                                                                                                                         EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                       Gaps
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                                                                                                                                                  MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY
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        Length 166;
                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                         121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
Score 864; DB 22;
Pred. No. 1.5e-67;
); Mismatches 2;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              AAE11979 standard; Protein; 166
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2000US-190844P.
2000WO-DK00471.
2000WO-DK00631.
  98.98;
98.88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       16-MAR-2001; 2001WO-DK00182.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 22; Page 136; 139pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                (first entry)
                                                                    Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            WPI; 2001-616274/71.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   (MAXY-) MAXYGEN APS
                                   Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     VO200168141-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             17-MAR-2000; 2
20-MAR-2000; 2
25-AUG-2000; 2
13-NOV-2000; 2
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Length 166;

Score 864; DB 22;

98.98;

Query Match

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90 do do do do do do

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27-AUG-1999;
21-OCT-1999;
26-NOV-1999;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            07-FEB-2000;
07-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            14-APR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Pedersen AH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      16-MAY-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             08-MAR-2001,
                                                                                                                                               Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAU00074;
                                                                                                                                                                                                                                                                                                                          61
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   8888888888
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    The sequence is Human interferon beta. Conjugates of the invention exhibiting interferon beta activity comprise at least one first non-polypeptide group covalently attached to an interferon beta polypeptide, the amino acid sequence of which differs from wild-type polypeptide, the amino acid sequence of which differs from wild-type human interferon beta in at least one introduced and at least one removed amino acid residue comprising an attachment group for the first non-polypeptide group. The invention also concerns reducing the serum half-life of an interferon beta polypeptide comprising introducing an amino acid residue constituting an attachment group for a first non-polypeptide group into a position exposed at the surface of the protein that does not contain such a group and removing an amino acid residue constituting an attachment group for a first non-polypeptide group and subjecting the modified peptide to conjugation with the
                                                                                                                                                                                                                                                                                                                                                                                                                     Human; interferon beta; antibody; multiple sclerosis; gene therapy; viral infection; viral hepatitis; cancer; breast cancer; inflammation; Crohn's disease; acute myeloid leukaemia; Hodgkin's disease;
                                                                                                             EMLQNIFAIFRODSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                              9
                   Gaps
                                                MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFSKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Rasmussen PB;
                                                                A conjugate exhibiting interferon beta activity useful for treal multiple sclerosis comprises a non-polypeptide group covalently attached to an interferon beta polypeptide -
                ;
                Indels
                                                                                                                                                                                             HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ΰ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Bornaes
98.8%; Pred. No. 1.5e-67;
ive 0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Andersen KV,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Example 1; Page 99-100; 108pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ulcerative colitis; immunomodulation.
                                                                                                                                                                                                                                                                                         AAU00038 standard; Protein; 166 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             99US-0160782.
99DK-0001691.
2000DK-0000194.
2000DK-0000363.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             HT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                99DK-0001197
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-AUG-2000; 2000WO-DK00471
                                                                                                                                                                                                                                                                                                                                                        (first entry)
                  Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Pedersen AH, Schambye
                                                                                                                                                                                                                                                                                                                                                                                         Human interferon beta.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          WPI; 2001-218488/22.
N-PSDB; AAS00067.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            (MAXY-) MAXYGEN APS
 Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WO200115736-A2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Homo saplens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              07-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14-APR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                27-AUG-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -OCT-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              26-NOV-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               07-FEB-2000;
                                                                                                                                                                                                                                                                                                                                                        16-MAY-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   08-MAR-2001
                                                                                                                                                                                                                                                                                                                        AAU00038;
                                                                                                                                                                                                                                                           10
              Matches
                                                                                                               61
                                                                                                                                                                         121
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non-polypeptide group. The conjugate and a cell culture expressing the mutated polypeptides are useful in the treatment of disease, especially multiple sclerosis, and for treathing mammals having circulating antibodies against interferon beta la or 1b. DNA encoding the mutated proteins may be used for gene therapy. The DNA and proteins can also be used to treat viral infections (e.g. viral hepetitis), cancer (e.g. breast cancer), inflammation, Crohn's disease, acute myeloid leukaemia, Hodgkin's disease and ulcerative colitis and for immunomodulation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Human; interferon beta; antibody; multiple sclerosis; gene therapy; viral infection; viral hepatitis; cancer; breast cancer; inflammation; Crohn's disease; acute myeloid leukaemia; Hodgkin's disease; ulcerative colitis; immunomodulation; mutant; mutein; Q49K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    EMLONIFAIFRODSSSTGWNETIVENLLANVYHOINHLKTVLEEKLEKEBFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnF9KEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Rasmussen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A conjugate exhibiting interferon beta activity useful for treat multiple sclerosis comprises a non-polypeptide group covalently attached to an interferon beta polypeptide -
                                                                                                                                                                                                                                                                                                                                                                                                                             .;
0
                                                                                                                                                                                                                                                                                                                                                             98.9%; Score 864; DB 22; Length 166; 98.8%; Pred. No. 1.5e-67; ive 0; Mismatches 2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     /note= "Wild-type Gln replaced with Lys"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Bornaes C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Andersen KV,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Location/Qualiflers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Ś
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Human interferon beta mutant Q49K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 AAU00074 standard; Protein; 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    2000DK-0000194.
2000DK-0000363.
2000DK-0000642.
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99US-0160782.
99DK-0001691.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             WPI; 2001-218488/22.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           (MAXY-) MAXYGEN APS
                                                                                                                                                                                                                                                                                                                                                                Query Match
Best Local Similarity
Matches 164; Consery
                                                                                                                                                                                                                                                                          166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Misc-difference
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Homo sapiens.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            16-NOV-2000
         Bentzien J;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAB49357;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        analogue
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ò
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                                                                          The sequence represents Human interferon beta mutant Q49K.

Conjugates of the Invention exhibiting interferon beta activity

comprise at least one first non-polypeptide group covalantly attached

to an interferon beta polypeptide, the amino acid sequence of which

differs from wild-type human interferon beta in at least one introduced

and at least one removed amino acid residue comprising an attachment

comprising the immunogenicity and/or increasing functional in vivo

reducing the immunogenicity and/or increasing functional in vivo

comprising introducing an amino acid residue constituting an attachment

group for a first non-polypeptide group into a position exposed at the

comprising introducing an amino acid residue constituting an attachment

group for a first non-polypeptide group into a position exposed at the

surface of the protein that does not contain such a group and removing

an amino acid residue constituting an attachment group for a first

con-polypeptide group. The conjugate and a cell culture

with the non-polypeptide group. The conjugate and a cell culture

cypressing the mutated polypeptides are useful in the treatment of

disease, especially multiple sclerosis, and for treating ammuls having

circulating antibodies against interferon beta la or lb. DNA encoding the

mutated proteins may be used for gene therapy. The DNA and proteins can

also be used to treat viral infections (e.g viral hepatitis), cancer

(e.g. breast cancer), inflammation, Crohn's disease, acute myeloid

furnammanda, Hodgkin's disease and ulcerative colitis and for
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ^{18}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Note: The present sequence is not shown in the specification but derived from the human interferon beta sequence given in AAU00038
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Score 864; DB 22; Dred. No. 1.5e-67; O; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AAB49356 standard; Protein; 166 AA.
Claim 11; Page - ; 108pp; English
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match
Best Local Similarity 98.8%;
Matches 164; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              12-MAY-2000; 2000WO-US13216
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99US-0133785
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Human INF-beta A-chain.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Immunomodulation.
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(IFN-beta) activity. These analogues are produced so that they are less than 97% identical to human IFN-beta. They are useful in the treatment of multiple sclerosis, cancer, particularly osteosarcoma, basal cell carcinoma, cervical dysplasia, glioma, acute myeloid leukaemia, multiple myeloma, Hodgkin's disease, melanoma, and renal, liver and breast encences, viral infections, including those caused by hepatitis viruses, herpes viruses and papilloma viruses, viral encephalitis, cytomegalovirus pneumonia and prophylaxis of rhinovirus, idiopathic pulmonary fibrosis
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                                                           Novel interferon-beta activity (IbA) proteins which have greater stability than interferon-beta (IFN-beta) useful for the treatment of IFN-beta related disorders such as multiple sclerosis -
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Pred. No. 1.5e-67;
0; Mismatches 2;
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98.88;
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                                                                                                                                                                                             Disclosure; Fig 1A; 109pp;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        and inflammatory diseases.
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Matches 164; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Human INF-beta B-chain.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       166 AA;
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Synthetic.
Homo sapiens.
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                                                                                      The present invention provides proteins which have interferon-beta (IFN-beta) activity. These analogues are produced so that they are less than 97% identical to human IFN-beta. They are useful in the treatment of multiple sclerosis, cancer, particularly osteosarcoma, basal cell carcinoma, cervical dysplasia, glioma, acute myeloid leukaemia, multiple myeloma, Hodgkin's disease, melanoma, and renal, liver and breast cancers, viral infections, including those caused by hepatitis viruses, herpes viruses and papilloma viruses, viral encephalitis, cytomegalovirus pneumonia and prophylaxis of rhinovirus, idiopathic pulmonary fibrosis
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            The inventors claim a process for the prodn. of heterologous polypeptide by transformed bacteria. The pref. promoter-operator is % \left( 1\right) =\left\{ 1\right\} =\left
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Polypeptide, esp. interferon, prodn. by transformed bacteria cultured in presence of a repressor which is consumed during
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Length 166;
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Pred. No. 1.5e-67;
0; Mismatches 2;
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                        Example 1; Fig 1B; 109pp; English.
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98.88;
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84CA-0445883.
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Best Local Similarity
Matches 164; Conserv
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23-JAN-1984;
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occurring polymer containing a polyalkylene glycol useful for treating e.g. tumors, autoimmune disorders, viral infections and angiogenic
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Interferon beta la; IFN-betala; polymer; polyalkylene glycol; tumour; cancer; autoimmune condition; fibrosis; lupus; multiple sclerosis; viral disease; angiogenic disease.
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trp which controls expression of structural genes encoding polypeptides of a synthetic pathway forming tryptophan, esp. at a concn. of 5.3T mg/l (T= predetermined turbidity value measured at 680nm, esp. 10-100). The transformed bacteria are esp. E.coli contg. the plasmid p-beta-1-trp. Example 1 concerns the construction of plasmid p-beta-1-trp for the direct expression of IFN-beta under the control of trp promoter-operator.
                                                                                                                                                                                                                                                                                                                                                                                                                                  1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      12 msynligflgrssnfgcgkllwglngrleyclkdrmnfdipeeikglggfgkedaaltiy 71
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Amino acid sequence of a His-tagged interferon beta la protein.
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                                                                                                                                                                                                                                                                                                                Length 177;
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18..183
/note= "natural interferon-betala"
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98.8%; Pred. No. 1.6e-67;
ive 0; Mismatches 2;
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/note= "His tag"
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Matches 164; Conservative
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                                                                                                                                                                                                                                 177 AA;
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Example 1: Fig 10: 73pp: English.

Example 1: Fig 10: 73pp: English.

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The present sequence represents a His-tagged interferon beta la

C(TFN-betala) protein. The protein is used to produce a composition

CC comprising a glycosylated IFN-beta coupled to a non-naturally-occurring

CC comprising a polyalkylene glycol. The composition has enhanced

CC sativity, measured by an antivitiral assay, as compared to physicologically

CC stay in the vasculature for longer periods of time, has increased

CC stay in the vasculature for longer periods of time, has increased

CC stability in solution, reduced immunogenicity, protection of the modified

CC stability in solution, reduced immunogenicity, protection of the modified

CC stability in solution, reduced immunogenicity, protection of the modified

CC stability in solution, reduced immunogenicity, protection of the modified

CC stability in solution, reduced immunogenicity, protection of the modified

CC of treatment of viral diseases, as well as autoimmune conditions such

CC stability in solution as an agent for the treatment of anglogenic

CC diseases. IFN-betala is useful as an agent for the treatment, remission

CC or attenuation of a disease state, physicological condition, symptoms or

CC or attenuation of a disease state, physicological condition, or disease

CC condition or disease state for which the IFN-betala constituent is

CC efficacious, in biological systems or specimens.

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Sequence 183 AA;
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Search completed: July 29, 2002, 15:42:54 Job time: 230 sec taurus

Q28843 oryctolagus Q28847 oryctolagus Q28847 oryctolagus Q2884 or services Q29085 sus scrofa Q29084 sus scrofa Q29098 sus scrofa Q29098 sus scrofa Q29096 homo sapien Q39000 homo sapien Q50719 mus musculu Q95128 sus scrofa Q29114 sus scrofa Q29114 sus scrofa Q29114 sus scrofa Q29114 sus scrofa Q61718 mus musculu Q94114 sus scrofa Q29114 sus scrofa

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Scoring table:

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Minimum DB Maximum DB

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Macaca fascicularis (Crab eating macaque) (Cynomolgus monkey).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Cercopithecidae;
Cercopithecinae; Macaca
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Matheux F., ie Grand R., Rousseau V., De Maeyer E., Dormont D.,
Lauret E..;
"Macaque lymphocytes transduced by a constitutively expressed
interferon beta gene display an enhanced resistance to SIVmac251
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        infection.";
Hum. Gene Ther. 10:429-429(1999).
-!- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 822; DB 6; Length 187; Pred. No. 2e-63;
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Last annotation update)
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HSSP; P01574; 1AU1.
InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
SMART; SM00076; IFabd; 1.
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Antiviral; Cytokine.
SEQUENCE 187 AA; 22266 MW; 376AEF7
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                                                                                                                                                                                                                                                    1 MSYNLLGFLQRSSNFQCQKL.....RVEILRNFYFINRLTGYLRN 166
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Maximum Match 100%
Listing first 45 summaries
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
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Bos taurus (Bovine).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoldea;
                                                                                                                                                                                                                                                                                               porcine interferon-beta.";
                                                                                                                                                                                                                                                     MEDLINE-92348930; PubMed-1640116;
Artursson K., Gobl A., Lindersson M., Johansson M., Alm G.;
"Molecular cloning of gene encoding porcine interferon-beta.",
J. Interferon Res. 12:153-160(1992).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Chung Y.G., Seidel G.E. Jr.;
"Cloning bovine interferon-tau genes and characterizing their transcriptional expression during early pregnancy.";
Submitted (FEB-2000) to the EMBL/GenBank/DDBJ databases.
-!- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 186;
                                                                                                                                                                SEQUENCE FROM N.A.
Artursson K., Gobl A., Lindersson M., Johansson M., Alm (
Submitted (FEB-1992) to the EMBL/GenBank/DDBJ databases.
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INTERFERON-BETA-1.
5 5F16B8B3C3AE603D CRC64;
                                                                                            Craniata; Vertebrata;
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Mammalia, Eutheria, Cetartiodactyla, Suina, Suidae,
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             60.1%; Score 525.5; DB (60.8%; Pred. No. 7.1e-38; iive 28; Mismatches 36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 195
   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                          PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Created)
                                                                                                                                                                                                                                                                                                                                                                                                                          InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          21878 MW;
                                                                                                                                                                                                                                                                                                                                                                   EMBL; M86762; AAA31056.1; -. EMBL; S41178; AAB22723.1; -. HSSP; P01574; IAU1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Antiviral; Cytokine; Signal.
01-NOV-1996 (TrEMBLrel. 01, 01-NOV-1996 (TrEMBLrel. 01, 01-JUN-2001 (TrEMBLrel. 17, INTERFERON-BETA-1 PRECURSOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               01-MAR-2001 (TrEMBLrel. 16, 01-MAR-2001 (TrEMBLrel. 16, 01-DEC-2001 (TrEMBLrel. 19,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Matches 101; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SMART; SM00076; IFabd; 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bovidae; Bovinae; Bos.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          186 AA;
                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Best Local Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    SEQUENCE FROM N.A.
                                                                           Sus scrofa (Pig).
                                                                                                                                NCBI_TaxID=9823;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=9913;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERFERON TAU.
                                                                                                                                                                                                                                                                                                                                                      FAMILY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SEQUENCE
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Q9GLL5
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                                                                                                           EMLONIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEBFTRGKLMSSL 120
                                                                                                                            EMLONIFAIFRQDSSSTGWNETIVENLLANVYHOINHLKTVLEEKLEKEDFTRGKLMSSL 120
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                                   1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                        22 MSYNLLGFLQRSSSFQCQKLLWQLNGRLEYCLKDRMWFDIPEEIKQPQQFQKEDAALTIY 81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
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                                                                                                                                                                                                                                                                                                                                                                                                                                           Craniata; Vertebrata; Euteleostomi;
Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Content J.; The human filbroblast and human immune interferon genes and their
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           expression in homologous and heterologous cells.";
Philos. Trans. R. Soc. Lond., B, Biol. Sci. 299:29-38(1982).
-1- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
FAMILY.
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SEQUENCE FROM N.A.
MEDLINE-83065590; PubMed-6183692;
Fiters W., Remaut E., Devos R., Cheroutre H., Contreras R.R.,
Gheysen D., Degrave W.M., Stanssens P., Tavernier J., Taya Y.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Score 817; DB 4; Length 187;
Pred. No. 5.3e-63;
1; Mismatches 8; Indels
 Indels
                                                                                                                                                                                                    142 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFFFINKLTGYLRN 187
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22 187 INTERFERON-BETA.
187 AA; 22251 MW; D8EE65B694862061 CRC64;
                                                                                                                                                                                                                                                                                                                                                01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
INTERFERON-BETA PRECURSOR.
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SMART; SMO076; Isabd; 1.

PROSITE; PS00252; INTERPERON_A_B_D; UNKNOWN_1.

Antiviral; Cytokine; Signal.

POTENTIAL.

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Mismatches
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                                                                                                                                                                                                                                                                                                                PRT;
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7;
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Mammalla; Eutherla; Primates;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 EMBL; M25460; AAC41702.1; -. HSSP; P01574; 1AU1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Query Match 93.5%;
Best Local Similarity 94.6%;
Matches 157; Conservative
Conservative
                                                                                                                                                                                                                                                                                                              PRELIMINARY;
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                                                                                                                                                                                                                                                                                                                                                                                                                          Homo sapiens (Human).
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Matches 154;
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99 AWDETLLDKFYIELFQQLNDLEACVTQEVGVEEIALMNEDSILAVRKYFQRITLYLMGKK 158
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                                                                                                                                                                                                                                                                                                                                                         Austruy E., Bagnis C., Carbuccia N., Maroc C., Birg F., Dubreuil P., Mannoni P., Chabannon C.;
"A defective retroviral vector encoding human interferon alpha 2 can transduce human leukemic cell lines.";
Cancer Gene Ther. 5.247-256(1998).
EMBL: Y11834; CAA72552.1; -
SIGNAL
SIGNAL
SIGNAL
SEQUENCE 188 AA; 21578 MW; 9BAA221D2BFB421D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            40 LLAQMRRISLFS-------CLKDRHDFGFPQE--EFGNQFQKAETIPVLHEMI 83
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  5 LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQn-FSKEDAALTIYEML 63
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encoding interferon-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         84 QQIFNLFSTKDSSAAWDETLLDKFYTELYQQLNDLEACVIQGVGVTETPLMKED----
                                                                                                                                                                                                                                      Homo sapiens (Human).
Buskryyota: Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_TaxID=9606;
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           J. Interferon Res. 13:313-322(1993).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       - SILAVRKYFQRITLYLKEKKYSPCAWEVVRAEIMRSFSLSTNLQESLRS 186
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(TrEMBLrel. 01, Last sequence update)
(TrEMBLrel. 19, Last annotation update)
                                                                                                                                                             (TrEMBLrel. 19, Created)
(TrEMBLrel. 19, Last sequence update)
(TrEMBLrel. 19, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        28.1%; Score 245.5; DB 4; 35.3%; Pred. No. 9.7e-14; ive 26; Mismatches 53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDIINE-94132653; Pubmed-8301151;
Charlier M., L'Haridon R., Boisnard M., Martal
"Cloning and structural analysis of four genes
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                             138 YSHCAWTIVRVEILRNFYFINRLTGYLR 165
                                             159 YSPCAWEVVRAEIMRSFSFSTNLQKGLR
                                                                                                                                                                                                                                                                                                [1]
SEQUENCE FROM N.A.
TISSUB-PLACENTA;
MEDLINE-98357449; PubMed-9694076;
                                                                                                                                                                                                           INTERFERON ALPHA 2 PRECURSOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EMBL; S68999; AAC60525.2;
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                                                                                                                                    PRELIMINARY;
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01-NOV-1996 (
01-DEC-2001 (
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01-DEC-2001
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                                                                                                                                 Q96KI6
Q96KI6;
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Q28844
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                                                                                                                                                                                                                                                                                              77 TGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAK 136
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                                                                                                                                                                                                                                      19 KLLWQLNGRL--EYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQNIFAIFRQDSSS 76
                                                                                                                                                                                                                                                       40 LLAQM-GRISHFSCLKDRYDFGFPQEVFDGNQFQKAQAISAFHEMIQQTFNLFSTKDSSA 98
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Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_TaxID=9606;
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                                                                                                                                                                               Length 195;
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SEQUENCE 189 AA; 21810 MW; E6D8D9E726E04344 CRC64;
                                                                                                                  Antiviral; Cytokine.
SEQUENCE 195 AA; 22139 MW; 689C2443B203E50A CRC64;
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Last annotation update)
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                                                                                                                                                                                                           50;
                                                                                                                                                                            29.2%; Score 255.5; DB 6 39.0%; Pred. No. 1.4e-14;
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PROSITE; PS00252; INTERFERON_A_B_D; 1.
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PROSITE; PS00252; INTERFERON_A_B_D; 1.
                        InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
PRINTS; PR00266; INTERFERONAB.
ProDom; P0000550; Interferon_abd; 1.
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AF238613; AAG14170.1;
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                                                                                                                                                                                                           53; Conservative
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                HSSP; P01563; 2HIE
                                                                                                                                                                                           Local Similarity
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Q14618;
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Matches
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Indels

Length 188;

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"Cloning, expression and biological activity of a new variant of human interferon alpha identified in virus induced lymphoblastoid cells."; Dev. Biol. 60:111-122(1985).
--- FMHILARITY: BEHONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Ceccacci A., Aurisicchio L., Ciliberto G., Palombo F., Traboni C., "Recombinant cotton-top tamarin interferon: a new tool for a primate hepartitis model."; Submitted (OCT-1999) to the EMBL/GenBank/DDBJ databases.
EMBL, AJ250196; CAC44125.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        31 CLKDRMNFDIPEEIKQLQnFSKEDAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLAN 90
                                                                                                                                     Saguinus oedipus (Cotton-top tamarin).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Platyrrhini; Callitrichidae; Saguinus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Homo sapiens (Human).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Length 189;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A.
MEDLINE-86005847; PubMed-2995168;
Cohen S., Velan B., Grosfeld H., Shalita Z., Leitner M.,
                                                                                                                                                                                                                                                                                                                                                                  1 : 23 POTENTIAL,
24 189 INTERFERON-ALPHA,
189 AA; 22052 MW; 9E4389CFEC329DBA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                189 AA; 22048 MW; 2AF6F48447BB72B3 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-JUN-2001 (TrEMBLrel. 17, Last annotation update)
                                                              Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                             Ouery Match 27.7%; Score 242; DB 6; L
Best Local Similarity 36.0%; Pred. No. 2e-13;
Matches 49; Conservative 27; Mismatches 60;
       189 AA.
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HSSP, PO1563; ZHIE.
InterPro. IPR000471; Interferon_abd.
Pfan, PF00143; interferon; 1.
PRINTS: PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
SMART; SM00076; IFabd; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROSITE; PS00252; INTERFERON_A_B_D; 1.
Antiviral; Cytokine.
SEQUENCE 189 AA; 22048 MW; 2AF6F48
                                              Created)
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                                         01-DEC-2001 (TrEMBLrel. 19, 01-DEC-2001 (TrEMBLrel. 19, 01-DEC-2001 (TrEMBLrel. 19, INTERFERON-ALPHA PRECURSOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         151 LRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                :|:| | | |:
172 MRSFSLSTNLQKGLRS 187
     PRELIMINARY;
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                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
                                                                                                                                                                                             NCBI_TaxID=9490;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                NCBI_TaxID=9606
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                                                                                                                                                                                                                                                                                                                                                Signal.
SIGNAL
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Q14607
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                                                                                                                                                                                                                                                                                                               Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                SEQUENCE FROM N.A.

Ceccacci A., Aurisicchio L., Ciliberto G., Palombo F., Traboni C.;
"Recombinant cotton-top tamarin interferon: a new tool for a primate hepatitis model.";
Submitted (OCT-1999) to the EMBL/GenBank/DDBJ databases.

EMBL; AJ250195; CAC44124.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        14; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               40 LLAQMRRISPFS------CLKDRRDFEFPQEEFDGNQFQKARAIFVLHEMIQ 85
                                                                                                                                                                                                                                                                                         31 CLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLAN 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5 LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQ 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Memmalia; Eutherla; Primates; Platyrrhini; Callitrichidae; Saguinus.
NCBI_TaxID=9490;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 27.9%; Score 244; DB 6; Length 189; 33.3%; Pred. No. 1.3e-13;
                                                                                                                                                                                                                                                    53; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      65; Indels
HSSP; P01563; 2HIE.
InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
PRINTS; PR00056; INTERFERONAB.
ProDom; PD00056; Interferon_abd; 1.
SMART; SM0076; IFabd; 1.
ANGITE; PS00252; INTERFERON_A_B_D; 1.
Antiviral; QYtokine.
SEQUENCE 195 AA; 21981 MW; D4D2E3EF5134AE5F CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         POTENTIAL.
06A45DD2B631C85C CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Last sequence update)
Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Query Match

28.0%; Score 245; DB 6;
Best Local Similarity 41.1%; Pred. No. 1.1e-13;
Matches 51; Conservative 20; Mismatches 53.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           189 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      29; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       POTENTIAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Saguinus oedipus (Cotton-top tamarin).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Created)
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189 PO
21937 MW;
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Matches 54; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
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24 1
189 AA;
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RESULT Q95J78

SEQUENCE

Signal

Query Match

RESULT 095J77

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91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTJVRVEI 150
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                                                                                                                                                                                                                                       SEQUENCE FROM N.A.

Zeng Q., Li M., Zhou Y., Guo H., Hou Y.;

"The cloning, sequencing of the primary structure and expression in coli Chinese human IFN-W1 gene.";

Sci. China B. 0:0-0(0).
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| SEQUENCE FROM N.A. | No. | No
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Oryctolagus cuniculus (Rabbit).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.
                                                                                                          Homo sapiens (Human).
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
                                                                                                                                                                                                                                                                                                                                                                                                                          Xu_L.;
Submitted (APR-1995) to the EMBL/GenBank/DDBJ databases.
-!- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              27.1%; Score 237; DB 4; Length 17 33.8%; Pred. No. 4.8e-13; Live 32; Mismatches 58; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    B1CC9AB5993016C5 CRC64;
                           Last sequence update)
Last annotation update)
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01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMBL, U25670; AAA70091.1; -.
HSSP, P01563; ZHIE.
InterPro; IPR000471; Interferon_abd.
Ffam; PF00143; interferon; 1.
PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
SWART; SW0076; IFabd; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     PROSITE; PS00252; INTERFERON_A_B_D; 1. Antiviral; Cytokine.
     Created)
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01-NOV-1996 (TrEMBLrel. 01, Cre
01-NOV-1996 (TrEMBLrel. 01, Las
01-DEC-2001 (TrEMBLrel. 19, Las
INTERFERON OMEGA-1 (FRAGMENT).
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Best Local Similarity
Matches 46; Conserv
                                                                                                                                                                                                                                                                                                                                                                       [2]
SEQUENCE FROM N.A.
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                                                                                                                                                                                        NCBI_TaxID=9606;
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SEQUENCE
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Q28845
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                                                                                                                                                                                                                                                                  GWNETIVENLLANVYHQINHLKT-----VLEEKLEKEDFTRGKLMSSLHLKRYYGRIL 130
                                                                                                                                                                                                                                                                                                   99 AWEQSLLEKFSTELYQQLNDLEACVIQEVGVEETPLANNEDFI------LAVRKYFQRIT 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              77 TGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAK 136
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                                                                                                          Gaps
                                                                                                                                                                                              40 LLAQM-GRISPFSCLKDRHEFRFPEEEFDGHQFQKTQAISVLHEMIQQTFNLFSTEDSSA 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidae; Bovinae; Bos.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 SEQUENCE FROM N.A.
Chung Y.G., Seidel G.E. Jr.;
Cloning bovine interferon-tau genes and characterizing their
transcriptional expression during early pregnancy.";
Submitted (FEB-2000) to the EMBL/GenBank/DDBJ databases.
-1- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                       17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        3;
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                                                         Length 189;
                                                                                                       Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        6DBlFAE39BF033FA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Last sequence update)
Last annotation update)
                                                   Query Match 27.6%; Score 241.5; DB 4; Best Local Similarity 37.4%; Pred. No. 2.2e-13; Matches 58; Conservative 22; Mismatches 58;
                                                                                                                                                                                                                                                                                                                                                                       131 HYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLR 165
                                                                                                                                                                                                                                                                                                                                                                                                  ¥.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             195 AA
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HSSP. P01563; ZHIE.
InterPro: IPR000471; Interferon_abd.
Pfam: PF00143; Interferon; 1.
PRINTS; PR00266; INTERPERONAB.
ProDom; PD000550; Interferon_abd; 1.
SMART; SM00076; IFBdd; 1.
Antiviral. Cytokine.
SEQUENCE 195 AA; 22160 MW; 6DBIFAE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Created)
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EYSDCAWEIIRVEMMR 173
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Bos taurus (Bovine).
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01-MAR-2001 (
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Q9GLL6 Q9GLL6;

RESULT 11

Query Match

Local

Matches

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013168 ID 01 AC 01

RESULT 12

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Gaps

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Search completed: July 29, 2002, 15:44:50 Job time: 196 sec
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                                                                         151 LRNF 154
                                                                                                                         172 RRAF 175
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-1- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                    ||||| :| | |: | | |: | | CLKDRRDEQFPREVVNGSQFQKNQTVSVLHEMLQQIFNLLHTARSSAAWNNTLLEELHTA 111
                                                                                                                                                                                                                                                                                                                                                                                                                         91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
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                                                                                                                                                                                                                                                                                      Gaps
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                                                                                                                                                                                                                                    27.1%; Score 237; DB 6; Length 195;
39.5%; Pred. No. 5.5e-13;
Live 20; Mismatches 55; Indels
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InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; Interferon; 1.
PRINTS; PR00266; INTERFERONAB.
PROMOTO; INTERFERONAB.
SMART; SM00076; Irabd; 1.
PROSITE; PS00252; INTERFERON_A_B_D; 1.
Antiviral; Cytokine.
SEQUENCE 195 AA; 21996 MW; 395EE700C586A928 CRC64;
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195 OVINE INTERFERON ALPHA.
22006 MW; 3B8EE700C586A928 CRC64;
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Last annotation update)
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39.5%; Pred. No. 5.5e-13;
11ve 20; Mismatches 55;
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HSSP; P01563; ZHIE.
InterPro; IPR000471; Interferon_abd.
Pfan; PF00143; interferon; 1.
PRINTS; PR00266; INTERERENOMB.
ProDom; PD000550; Interferon_abd; 1.
SMART; SM00076; IRBd; 1.
PROSITE; PS00252; INTERFERON_A_B_D; 1.
Antiviral; Cytokine; Signal.
SIGNAL
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Matches 49; Conserv
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Best Local Similarity
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91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
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"A type I ovine interferon with limited similarity to IFN-alpha, IFN-
omega and IFN-tau; gene structure, biological properties and unusual
species specificity.";
Blochim. Blophys. Acta, Gene Struct. Expr. 1294:55-62(1996).
-1- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
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Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
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22010 MW; 15C4CD45D582F86E CRC64;
                                                                                                                                                                                                                                                                                                                                  Last sequence update)
Last annotation update)
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HSSP; P01563; ZHIE.
InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; Interferon; I.
PRINTS; PR00266; INTERFERONAB.
PRODOM; PD000550; Interferon_abd; I.
PROSITE; PS00252; INTERFERONAB.
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01-NOV-1996 (TrEMBLrel. 01, Last seq
01-DEC-2001 (TrEMBLrel. 19, Last ann
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MEDLINE-96219886; Pubmed-8639714;
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                                                                                                                                                                                                                                                                                                                                                                                    INTERFERON TYPE I PRECURSOR. Ovis aries (Sheep).
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interferon b interferon b Human INF-beta A-c Human INF-beta B-c Sequence of beta-1 Amino acid sequenc Histidine tagged-h Sequence of fibrob Human fibroblast 1

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OM protein

Run on:

Sequence:

Minimum DB Maximum DB

Database

Result

Searched:

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Human; interferon beta; antibody; multiple sclerosis; gene therapy; viral infection; viral hepatitis; cancer; breast cancer; inflammation; Crohn's disease; acute myeloid leukaemia; Hodgkin's disease; ulcerative colitis; immunomodulation; mutant; mutein; Q49N/Q51T.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Human interferon beta mutant Q49N/Q51T.
                                             AAB49357
AAB50261
AAY70866
AAP10016
AAP20026
AAP20026
AAR01154
AAW61154
AAB49776
AAY70867
AAB49776
AAY70867
AAP60687
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AAU001143
AAU001143
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AAU00073
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AAU00139
AAP50197
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99US-0160782.
99DK-0001691.
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21-OCT-1999;
26-NOV-1999;
07-FEB-2000;
07-MAR-2000;
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128: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
129: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
120: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
121: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
128: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
129: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
120: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
121: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
122: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
129: /SIDSI/gcgdata/hold-geneseq/geneseqp-embl/AA1999.DAT:*
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Sequence encoded b
Protein sequence e
Oxidation resistan
                                                                                                        July 29, 2002, 15:42:54; Search time 51.64 Seconds (without alignments) 357.054 Million cell updates/sec
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Human native inter
Mature human beta-
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Human interferon b
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.
                                                                                                                                                                                                       1 MSYNLLGFLQRSSNFQCQKL.....RVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Description
              GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd.
                                                                                                                                                                                                                                                                                                                  Total number of hits satisfying chosen parameters:
                                                                                                                                                                                                                                                                                    747574 segs, 111073796 residues
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SUMMARIES
                                                                                                                                                                                                                                                                                                                                                                                               Post-processing: Minimum Match 0%
Maximum Match 100%
Listing first 45 summaries
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AAU00103
AAU00150
AAP30219
AAP50262
AAP50279
AAP61071
AAP61071
                                                                             protein search, using sw model
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    AAE10346
AAE11979
AAE11979
                                                                                                                                                                                                                                                       Gapop 10.0 , Gapext 0.5
                                                                                                                                                                                                                                                                                                                                                                                                                                                  A_Geneseq_032802:*
                                                                                                                                                                                                                                                                                                                                                   seq length: 0
seq length: 200000000
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2224
222
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                                                                                                                                                                        SEQ2-49N-51T
875
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Match 1
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863
863
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Human ilbroblast i Human interferon b Human interferon b

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Query Match
Best Local Similarity
   NAMES OF COLORD 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     an amino acid residue constituting an attendment group for a first non-polypeptide group and subjecting the modified peptide to conjugation with the non-polypeptide group. The conjugate and a cell culture expressing the mutated group. The conjugate and a cell culture disease, especially multiple sclerosis, and for treating mammals having circulating antibodies against interferon beta la or 1b. DNA encoding the mutated proteins may be used for gene therapy. The DNA and proteins can also be used to treat viral infections (e.g viral hepatitis), cancer (e.g. breast cancer), inflammation, Crohn's disease, acute myeloid immunomodulation.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       conjugates of the invention exhibiting interferon beta activity comprises at least one first non-polypeptide group covalently attached to an interferon beta polypeptide, the amino acid sequence of which differs from wild type human interferon beta in at least one introduced and at least one removed amino acid residue comprising an attachment aroup for the first non-polypeptide group. The invention also concerns reducing the immunogenicity and/or increasing functional in vivo half-life and/or serum half-life of an interferon beta polypeptide comprising introducing an amino acid residue constituting an attachment
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                group for a first non-polypeptide group into a position exposed at the surface of the protein that does not contain such a group and removing
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Human; interferon beta; antibody; multiple sclerosis; gene therapy;
viral infection; viral hepatitis; cancer; breast cancer; inflammation;
Crohn's disease; acute myeloid leukaemia; Hodgkin's disease;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           EMLONIFAIFRODSSSTGWNETIVENLLANVYHOINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   <del>;</del>3
                                                                                                                                                                                                                                                                conjugate exhibiting interferon beta activity useful for treating
                                                                                                                                     Rasmussen PB;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Note: The present sequence is not shown in the specification but is derived from the human interferon beta sequence given in AAU00038.
                                                                                                                                                                                                                                                                                           multiple sclerosis comprises a non-polypeptide group covalently attached to an interferon beta polypeptide -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                               sequence represents Human interferon beta mutant Q49N/Q51T
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                121 hlkryygrilhylkakeyshcawtivrveilrnfyfinrltgylrn 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Human interferon beta mutant K19R/K45R/Q49K/Q51T/K123R.
                                                                                                                                 Bornaes C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Score 869; DB 22;
Pred. No. 2.4e-70;
0; Mismatches 1;
                                                                                                                                 Andersen KV,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           AAU00103 standard; Protein; 166 AA.
                                                                                                                                                                                                                                                                                                                                                                                              Claim 39; Page - ; 108pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            99.38;
99.48;
14-APR-2000; 2000DK-0000642
                                                                                                                              Schambye HT,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             16-MAY-2001 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
                                                                                                                                                                                           WPI; 2001-218488/22.
                                                                (MAXY-) MAXYGEN APS.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Best Local Similarity
Matches 165; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Sequence 166 AA;
                                                                                                                              Pedersen AH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            AAU00103;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                               The
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The sequence is Human interferon beta mutant K19R/K45R/Q49K/Q51T/K123R.

Conjugates of the invention exhibiting interferon beta activity comprise at least one first non-polypeptide group covalently attached to an interferon beta polypeptide, the amino acid sequence of which differs from wild-type human interferon beta in at least one introduced and at least one removed amino acid residue comprising an attachment group for the first non-polypeptide group. The invention also concerns reducing the immunogenicity and/or increasing functional in vivo half-life and/or serum half-life of an interferon beta polypeptide comprising introducing an amino acid residue constituting an attachment group for a first non-polypeptide group into a position exposed at the surface of the protein that does not contain such a group and removing an amino acid residue constituting an attachment group for a first non-polypeptide group. The conjugate and a cell culture on-polypeptide group. The conjugate and a cell culture with the non-polypeptide group. The conjugate and a cell culture disease, especially multiple sclerosis, and for treating mammals having circulating antibodies against interferon beta la or 1b. DNA encoding the mutated proteins may be used for gene therapy. The DNA and proteins can be used to treat viral infections (e.g viral hepatitis), cancer (e.g. breast cancer), inflammation, crohn's disease, acute myeloid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             A conjugate exhibiting interferon beta activity useful for treating multiple sclerosis comprises a non-polypeptide group covalently attached to an interferon beta polypeptide -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Rasmussen PB;
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                                                                                                                                                                                                                                                 'note= "Wild-type Lys replaced with Arg"
                                                                                                                                                                                                                                                                                                                   "Wild-type Lys replaced with Arg"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  with Thr"
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    /note= "Wild-type Lys replaced with Arg"
ulcerative colitis; immunomodulation; mutant; mutein; K19R/K45R/Q49K/Q51T/K123R.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Bornaes C,
                                                                                                                                                                                                                                                                                                                                                                                            "Wild-type Gln replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                              'note= "Wild-type Gln replaced
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Andersen KV,
                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Claim 35; Page - ; 108pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             2000DK-0000194.
2000DK-0000363.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 25-AUG-2000; 2000WO-DK00471
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99DK-0001691
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Misc-difference 123
                                                                                                                                                                                                                Misc-difference 19
                                                                                                                                                                                                                                                                                  Misc-difference 45
                                                                                                                                                                                                                                                                                                                                                        Misc-difference 49
                                                                                                                                                                                                                                                                                                                                                                                                                         Misc-difference 51
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                                                                                                             Homo sapiens.
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26-NOV-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          27-AUG-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     07-mar-2000;
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Length 166;

Score 866; DB 22; Pred. No. 4.4e-70;

99.0%; 98.2%;

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Creasey AA;
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N-PSDB; AAN30152.
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                                                                                                                                                                                                                                        Similarity
                                                                                                                                                                                                    Sequence 166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           19-JAN-1982;
03-FEB-1983;
15-JUL-1985;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Homo sapiens,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        18-JAN-1983;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    WO8302461-A.
                                                                                                                                                                                                                                                 Matches 164;
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                                                                                                                                                                                                                                Query Match
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                                                                                                                                                                                                                                      Human; interferon beta; antibody; multiple sclerosis; gene therapy; viral infection; viral hepatitis; cancer; breast cancer; inflammation; Crohn's disease; acute myeloid leukaemia; Hodgkin's disease; ulcerative colitis; immunondulation; mutant; mutant; mutant
                                                                 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
Gaps
                   9
                                      9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           useful for treating
                            MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Rasmussen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A conjugate exhibiting interferon beta activity useful for trea multiple sclerosis comprises a non-polypeptide group covalently attached to an interferon beta polypeptide -
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                                                                                                                                                                                                                                                                                                                                                                                         "Wild-type Gln replaced with Thr"
                                                                                            HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                       Bornaes C,
ó
                                                                                                                                                                                                                    Human interferon beta mutant S2N/N4T/Q49N/Q51T.
Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Andersen KV,
                                                                                                                                                                                                                                                                                                                                                   /note= "Wild-type Asn
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Disclosure; Page - ; 108pp; English.
                                                                                                                                                                                                                                                                                                               Location/Qualifiers
                                                                                                                                                                ¥.
                                                                                                                                                              AAU00150 standard; Protein; 166
3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            99US-0160782.
99DK-0001691.
2000DK-0000194.
2000DK-0000363.
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                                                                                                                                                                                                  (first entry)
Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Schambye
                                                                                                                                                                                                                                                                                                                                                                                          /note-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        WPI; 2001-218488/22.
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                                                                                                                                                                                                                                                                                                                                                             Misc-difference 49
                                                                                                                                                                                                                                                                           S2N/N4T/Q49N/Q51T.
                                                                                                                                                                                                                                                                                                                        Misc-difference
                                                                                                                                                                                                                                                                                                                                           Misc-difference
                                                                                                                                                                                                                                                                                                                                                                               Misc-difference
                                                                                                                                                                                                                                                                                                                                                                                                          WO200115736-A2
                                                                                                                                                                                                                                                                                                                                                                                                                                                25-AUG-2000;
                                                                                                                                                                                                                                                                                              Homo saptens
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Pedersen AH,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             07-FEB-2000;
07-MAR-2000;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14-APR-2000;
                                                                                                                                                                                                  16-MAY-2001
                                                                                                                                                                                                                                                                                                                                                                                                                                                                   27-AUG-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                             21-OCT-1999;
26-NOV-1999;
                                                                                                                                                                                                                                                                                                                                                                                                                              08-MAR-2001
163;
                                                                                                                                                                               AAU00150
                                                                                             121
Matches
                                                        19
                                                                                                                                                     AAU00150
                                                                                                                                            RESULT
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and at least one removed amino acid residue comprising an attachment group for the first non-polypeptide group. The invention also concerns ceducing the immunogenicity and/or increasing functional in vivo thalf-life and/or serum half-life of an interferon beta polypeptide comprising introducing an amino acid residue constituting an attachment of group for a first non-polypeptide group into a position exposed at the surface of the protein that does not contain such a group and removing an amino acid residue constituting an attachment group for a first on-polypeptide group and subjecting the modified peptide to conjugation with the non-polypeptide group. The conjugate and a cell culture expressing the mutated polypeptides are useful in the treatment of disease, especially multiple sclenosis, and for treating mammals having circulating antibodies against interferon beta la or 1b. DNA encoding the mutated proteins may be used for gene therapy. The DNA and proteins can also be used to treat viral infections (e.g. viral hepatitis), cancer (e.g. breast cancer), inflammation, Crohn's disease, acute myeloid clenkaemia, Hodgkin's disease and ulcerative colitis and for when who wrecen
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            ö
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Note: The present sequence is not shown in the specification but is derived from the human interferon beta sequence given in AAU00038.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 ;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Length 166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence of interferon (HuIFN) -beta-1 encoded by plasmid pDM101/trp/beta-1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Hybrid interferon; antiviral; therapy; cancer; tumour.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Score 866; DB 22;
Pred. No. 4.4e-70;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     1; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  AAP30219 standard; Protein; 166 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    83US-0340782.
83US-0463574.
85US-0755265.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 99.0%;
98.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       83WO-0900607
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           25-MAY-1992 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Conservative
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Example; Fig 5; 12pp; English.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           28-JUN-1984;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   01-JUL-1983;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          09-DEC-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          23-JAN-1985.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EP131816-A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Synthetic.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     AAP50279;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Bell LD,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sequence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         x \overset{\mathsf{x}}{x} \overset{\mathsf{x}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           셤
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Db
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ö
                                                                                                                                                                                                   DNA unit having a nucleotide sequence which encodes it. Pref. the AA sequence consists of alpha and beta interferons. Pref. Its is a sequence consists of alpha and beta interferons. Pref. IF1 is of Hulfn-alpha-1 (and IF2 is the 74-166 AA seq. of Hulfn-beta-1) (see AANNO155, AAP30222); or (ii) the 1-41 AA seq. of Hulfn-alpha-61A (and IF2 is the 43-166 AA seq. of Hulfn-beta-1) (see AANNO165, AAP30222); or (iii) the i-41 AA seq. of Hulfn-alpha-61A (and IF2 is the carboxy terminal of an alpha-IF (sep. the beta-IF and IF2 is the carboxy terminal of an alpha-IF (sep. the i-73 seq. of Hulfn-beta-1 and the 74-167 seq. of Hulfn-alpha-1 resp.) (see AANNO156, AAP30223). In the examples plasmids pGW5 and pDM101/trp/beta-1 and p-alpha-61A were used (see AANNO151, AANNO152, AANNO157). Hinfl was used to digest the DNA sequences in the region of significant handicaps (see ANNO153, AANNO154, AANNO158, AANNO159), and the restriction fragments were ligated to form hybrid DNA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEBETRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                         The inventors claim a multiclass hybrid interferon polypeptide and a
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY 60
Multi:class hybrid interferon poly:peptide(s) - with restricted antiviral and cell growth regulatory activities
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Sequence encoded by the sequence between the EcoRI site and the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             ő
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Polypeptide, esp. interferon, prodn. by transformed bacteria cultured in presence of a repressor which is consumed during
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Score 863; DB 4; Length 166;
Pred. No. 8.2e-70;
0; Mismatches 2; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        AAP50262 standard; Protein; 166 AA.
                                                                                                     Example; Fig 5; 61pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        98.68;
98.88;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         820S-0375098
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      xholl site of p-beta-1-trp
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      WPI; 1985-055962/09.
N-PSDB; AAN50289.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  05-MAY-1982;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          05-MAY-1982;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           23-JAN-1984;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Best Local Sim:
Matches 164;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            US4499188-A
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Konrad MW,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Seguence
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             AAP50262;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   growth
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   # # X % X O O O O O O O O O O O O O X M
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61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                     polypeptide by transformed bacteria. The pref. promoter-operator is try which controls expression of structural genes encoding polypeptides of a synthetic pathway forming tryptophan, esp. at a concn. of 5.37 mg/l (T* predetermined turbidity value measured at 680nm, esp. 10-100). The transformed bacteria are esp. E.coli contq. the plasmid p-beta-1-trp. Example 1 concerns the construction of plasmid p-beta-1-trp for the direct expression of IFN-beta under the
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       9
                                                                                                                                                                                                                                                                                                                                                                                                                                                   Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  The sequence encodes a synthetic interferon-beta which has increased biological activity compared to natural IRP-beta, and which is more effective in the treatment of viral or neoplastic diseases, or immunosuppressed or immunodeficient conditions.
                                                                                                                                                                                                                                                                                                                                                                                                                                            ó;
The inventors claim a process for the prodn. of heterologous
                                                                                                                                                                                                                                                                                                                                                                                                                                            Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Protein sequence encoding synthetic interferon-beta gene.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Interferon-beta; virucide; antitumor; immunostimulant.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           New modified beta-interferon(s) - useful as antiviral, anti-neoplastic and immuno-modulatory agents.
                                                                                                                                                                                                                                                                                                                                                                               Score 863; DB 6; L
Pred. No. 8.2e-70;
0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Houghton M;
                                                                                                                                                                                                                                                                                                                                                                                                                                            0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                AAP50279 standard; protein; 166 AA.
                                                                                                                                                                                                                                     control of trp promoter-operator.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Disclosure; Fig 20; 96pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Smith JC,
                                                                                                                                                                                                                                                                                                                                                                               98.6%;
98.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               84EP-0107498.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     (first entry)
                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity 98.8
Matches 164; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             (SEAR ) SEARLE G D & CO
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               WPI; 1985-020165/04.
N-PSDB; AAN50306.
                                                                                                                                                                                                                                                                                            166 AA;
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Query Match
Best Local Simi
Matches 164;
                                                                                                                                                                                 AAP70296;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Sequence
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                                                                                    EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                          Gaps
                                                        1 msynllgflgrssnfgcgkllwglngrleyclkdrmnfd1pecikglggfgkedaaltiy
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Modified peptide has residues susceptable to chloramine T and peroxide oxidation replaced with conservative AMs. Mutein is thus resistant to oxidisation. Other proteins which may be similarly rendered resistant include tissue plasmingen activator, colony stimulating factor and human growth factor.
                                          MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY
                          ö
                                                                                                                                                                                                                                                                               absent"
        Length 166;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Oxidn. resistant mutein(s) - prepd. by replacing oxidn.-susceptible methionine with conservative aminoacid
                         2; Indels
                                                                                                                     HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                            colony stimulating factor; CSF-1; tPA;
                                                                                                                                                                                                                                                                              note- "May be N-terminal truncated or
                                                                                                                                                                                                                                                                                               'note= "May be any conservative AA"
                                                                                                                                                                                                                                                                                                                                  note - "May be any conservative AA"
                                                                                                                                                                                                                                                                                                                                                  "May be any conservative AA"
                                                                                                                                                                                                                                                                                                                 'note= "May be any conservative
       Score 863; DB 6;
Pred. No. 8.2e-70;
0; Mismatches 2
                                                                                                                                                                                                                           Oxidation resistant mutein of Interferon-Beta,
                                                                                                                                                                         A.
                                                                                                                                                                                                                                                             Location/Qualifiers
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Innis MA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Claim 5; Page 50; 50pp; English.
                                                                                                                                                                       AAP61071 standard; Protein; 166
                                                                                                                                                                                                                                                                                                                                                                                                                     85US-0810656.
85US-0692596.
86AU-0064846.
86US-0893186.
        98.6%;
98.88;
                                                                                                                                                                                                                                                                                                                                                                                                      86AU-0052451
                                                                                                                                                                                                          (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Halenbeck RF,
                       Matches 164; Conservative
                                                                                                                                                                                                                                                                                                                                                    /note=
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                Similarity
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                                                                                                                                                                                                                                                                                       Misc-difference 17
                                                                                                                                                                                                                                                                                                        Misc-difference
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                                                                                                                                                                                                                                                                     Misc-difference
                                                                                                                                                                                                                                            IFN-Beta;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   166
                                                                                                                                                                                                          28-MAY-1991
                                                                                                                                                                                                                                                                                                                                                                                                      17-JAN-1986;
                                                                                                                                                                                                                                                                                                                                                                                                                       17-DEC-1985;
                                                                                                                                                                                                                                                                                                                                                                                                                               18-JAN-1985;
05-NOV-1986;
                                                                                                                                                                                                                                                                                                                                                                                                                                                05-AUG-1986;
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                                                                                                                                                                                                                                                                                                                                                                                    31-JUL-1986
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Koths KE,
                                                                                                                                                                                          AAP61071;
        Query Match
Best Local (
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence
                                                                                                                                                                                                                                            IL-2;
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EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
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                                           Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           The inventors claim an interferon conjugate wherein a C-terminal of the region exhibiting biological activities of interferon-beta has been linked to an N-terminal of the region exhibiting biological activities of interferon-gamma. The antiviral activity of the conjugate was tested using FL cells-sindbis virus system according to the CPE 50 inhibition method. Antiviral activity ranged from
                                                                             1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY
                                                                                                    Conjugates of interferon(s)-beta and-gamma - useful as antivirals and anti-cell proliferatives with broader spectrum of activity and obtd. economically by recombinant DNA procedures
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ;;
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  Length 166;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           2; Indels
                                         Indels
                                                                                                                                                                                                                                                                HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN
; DB 7; L
8.2e-70;
ches 2;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Score 863; DB 8;
Pred. No. 8.2e-70;
                                         0; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           0; Mismatches
  Score 863;
                    Pred. No.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Antiviral; antiproliferative agent.
                                                                                                                                                                                                                                                                                                                                                                                   A
                                                                                                                                                                                                                                                                                                                                                                               AAP70296 standard; protein; 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  98.6%;
98.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Sawada
  98.6%;
98.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Claim 7; p35; 52pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Sequence of interferon-beta.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       87EP-0103406
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            86JP-0054650.
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Matches 164; Conservative
                                           Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  200 U/ml to 18500 U/ml.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       (TORA ) TORAY IND INC
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Kawano G,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1987-258309/37.
                    Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           166 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     10-MAR-1987;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         14-MAR-1986;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  26-DEC-1986;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Homo sapiens
                                                                                                                                                                                                                                                                                                                                                                                                                                                             07-JUN-1991
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                16-SEP-1987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         EP237019-A.
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Human; beta-interferon; INF-beta; immune disease; demyelinating disease;
sub-acute sclerosing panencephalomyelitis; SSPE; multiple sclerosis;
metachromatic leukodystrophy; Guillain-Barre syndrome;
                                                                                                                                                                                                                                                                                                                                                                                                                                   Use of nucleic acid for the treatment of immune diseases
                                                                                                                                                                                                                 /note= "Encoded by CGT"
                                                                                                                                                                                           Location/Qualifiers
             AAE10346 standard; Protein; 166
                                                                                   Mature human beta-interferon.
                                                                                                                                                                                                                                                                                         20-FEB-2001; 2001EP-0103580.
                                                                                                                                                                                                                                                                                                                23-FEB-2000; 2000EP-0440053
07-NOV-2000; 2000US-0246089
                                                            (first entry)
                                                                                                                                                                                                                                                                                                                                                  (TRGE ) TRANSGENE SA.
                                                                                                                                                                                                                                                                                                                                                                                                WPI; 2001-572706/65.
                                                                                                                                             autoimmune disease.
                                                                                                                                                                                                                                                                                                                                                                                                                                               multiple sclerosis
                                                                                                                                                                                                                                                                                                                                                                                                          N-PSDB; AAD17506
                                                                                                                                                                                                      Misc-difference
                                                                                                                                                                     sapiens
                                                                                                                                                                                                                                          EP1133997-A2.
                                                                                                                                                                                                                                                                 19-SEP-2001.
                                                            10-DEC-2001
                                     AAE10346;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Seguence
                                                                                                                                                                                                                                                                                                                                                                         Braun S;
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AAE11979
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 AAE10346
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            This sequence represents a native human recombinant interferon-beta protein which is mutated into an amino acid having at least one hydroxy group substituted for at least one of Leus, Phe8, Phe15, Leu17, Phe50, Leu106, Phe111, Leu116, Leu120 and Phe156. Such mutants can be used in macloaments e.g. for treating multiple sclerosis, for in vitro screening assays and for measurement of interferon levels. The mutated protein is more water-soluble than recombinant wild-type human interferon-beta.
EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      New mutated recombinant human interferon-beta protein contains hydroxylic amino acid substitutions to improve water solubility vised e.g. in in vitro screening assays, to measure interferon levels and to treat multiple sclerosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Interferon-Beta; variant; human; medicament; treatment; screening;
multiple sclerosis; measurement; water soluble.
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                                  121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   98.6%; Score 863; DB 19;
98.8%; Pred. No. 8.2e-70;
11ve 0; Mismatches 2;
                                                                                                                                                                                                                                                                                                                                                                         (FRAU ) FRAUNHOFER GES FOERDERUNG ANGEWANDTEN.
                                                                                                                                                                                                                                                                                                                                                                                               Waschuetza G;
                                                                                                                                                                                         Human native interferon-beta protein.
                                                                                                                  AAW81774 standard; protein; 166
                                                                                                                                                                                                                                                                                                                                                                                              Schneider-Fresenius C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Disclosure; Fig 1; 18pp; German.
                                                                                                                                                                                                                                                                                                                          97DE-1017864
                                                                                                                                                                                                                                                                                                                                                  97DE-1017864
                                                                                                                                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 1998-569784/49.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match
Best Local Similarity
Matches 164; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           166 AA;
                                                                                                                                                                                                                                                                           DE19717864-A1.
                                                                                                                                                                                                                                                      Homo sapiens
                                                                                                                                                                                                                                                                                                                                                23-APR-1997;
                                                                                                                                                                                                                                                                                                                          23-APR-1997;
                                                                                                                                                                 29-JAN-1999
                                                                                                                                                                                                                                                                                                   29-0CT-1998
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                                                             The invention relates to use of nucleic acids expressing human beta interferon (INF-beta) for the treatment of immune diseases such as demyelinating disease (e.g. sub-acute sclerosing panencephalomyelitis (SSPE), metachromatic leukodstrophy, Guillain-Barre syndrome) and autoimmune disease (e.g. multiple sclerosis). The expression of the beta interferon results in the improvement of the clinical status of the treated mammal, thus avoiding the use of recombinant polypeptide. The nucleic acid is therefore compatible with the quality of life of the patients. The present sequence is mature human beta-interferon.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ;
0
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
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98.6%; Score 863; DB 22;
Best Local Similarity 98.8%; Pred. No. 8.2e-70;
Matches 164; Conservative 0; Mismatches 2;
Claim 9; Page 15; 21pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                   166 AA;
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RESULT

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Human; interferon beta; antibody; multiple sclerosis; gene therapy; viral infection; viral hepatitis; cancer; breast cancer; inflammation; Crohn's disease; acute myeloid leukaemia; Hodgkin's disease; ulcerative colitis; immunomdulation.
                                                                                                                                                                                                                                                                                                                                                                                                                                         A conjugate exhibiting interferon beta activity useful for treating multiple sclerosis comprises a non-polypeptide group covalently attached to an interferon beta polypeptide -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Example 1; Page 99-100; 108pp;
                                                                                                                                                                                                                                                                    21-0CT-1999; 99US-0160782.
26-NOV-1999; 99DK-0001691.
07-EBB-2000; 2000DK-0000194.
07-MAR-2000; 2000DK-0000363.
                                                                                                                                                                                                                                  25-AUG-2000; 2000WO-DK00471
                                     16-MAY-2001 (first entry)
                                                                Human interferon beta,
                                                                                                                                                                                                                                                                                                                                                                                                     WPI; 2001-218488/22.
                                                                                                                                                                                                                                                                                                                                                   (MAXY-) MAXYGEN APS.
                                                                                                                                                                                                                                                                                                                                                                                                                  N-PSDB; AAS00067
                                                                                                                                                                               WO200115736-A2.
                                                                                                                                                                                                                                                                                                                                                                             Pedersen AH,
                                                                                                                                                        Homo sapiens.
                                                                                                                                                                                                                                                          27-AUG-1999;
                                                                                                                                                                                                        08-MAR-2001
 The present invention relates to novel dispersions of a conjugate comprising at least one non-polypeptide molety covalently attached to a polypeptide variant, wherein the amino acid sequence of the polypeptide variant differs from that of the corresponding wild-type human polypeptide in that at least 1 residue comprising an attachment group for the non-polypeptide group has been introduced and/or removed. The wild-type human polypeptide is selected from the group consisting of interferon-gamma (FRG), interferon-beta, interferon alpha, follicle stimulating factor (G-CSF). The dispersion is used for the preparation of a medicament for pulmonary and/or circulatory administration. The present sequence is human wild type interferon (IFN) beta.
                                                                                                                                                                                                                                                                                                                                                                                                                Dispersions of particles for administration to the lung and circulatory
                                                                                                 Human; interferon-gamma; IFNG; interferon-beta; interferon alpha; FSi follicle stimulating hormone; granulocyte colony stimulating factor; G-CSF; interleukin 10; IL-10; medicament; pulmonary administration;
                                                                                                                                                                                                                                                                                                                                                                                                                              system by inhalation, e.g. from a nebulizer
                                                                            Human wild-type interferon (IFN) beta.
AAE11979 standard; Protein; 166 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                     Claim 22; Page 136; 139pp; English
                                                                                                                                                                                                                                                                   17-WAR-2000; 2000DK-0000447.
20-WAR-2000; 2000US-190844P.
25-AUG-2000; 2000WO-DK00471.
13-NOV-2000; 2000WO-DK00631.
                                                                                                                                                                                                                                              16-MAR-2001; 2001WO-DK00182
                                                                                                                                         circulatory administration.
                                                  (first entry)
                                                                                                                                                                                                                                                                                                                                                                                      WPI; 2001-616274/71.
                                                                                                                                                                                                                                                                                                                                      (MAXY-) MAXYGEN APS
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   166 AA;
                                                                                                                                                                                            WO200168141-A2.
                                                                                                                                                                    Homo sapiens.
                                                  18-DEC-2001
                                                                                                                                                                                                                    20-SEP-2001,
                                                                                                                                                                                                                                                                                                                                                              Hansen CK;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Sequence
                         AAE11979;
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Rasmussen PB;

Bornaes C,

Schambye HT, Andersen KV,

99DK-0001197

English

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catholiths interferon beta activity comprise at least one first non-polypeptide group covalently attached to an interferon beta polypeptide group covalently attached to an interferon beta polypeptide, the amino acid sequence of which differs from wild-type human interferon beta in at least one introduced and at least one removed canno acid residue comprising an attachment group for the first non-polypeptide group. The invention also concerns reducing the immunogenicity and/or increasing functional in vivo half-life and/or serum half-life of an interferon beta polypeptide comprising introducing an amino acid residue constituting an attachment group for a first non-polypeptide group into a position exposed at the surface of the protein that does not contain such a group and removing an amino acid residue constituting an attachment group for a first non-polypeptide group. The conjugate and a cell culture expressing the mutated polypeptides are useful in the treatment of disease, especially multiple sclerosis, and for treating mammals having circulating antibodies against interferon beta la multiple contains the mutated
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            proteins may be used for gene therapy. The DNA and proteins can also be used to treat viral infections (e.g viral hepatitis), cancer (e.g. breast cancer), inflammation, Crohn, Cancer (asse, acute myoloid leukaemia, Hodgkin's disease and ulcerative colitis and for immunomodulation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Gaps
The sequence is Human interferon beta. Conjugates of the invention
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY
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Pred. No. 8.2e-70;
0; Mismatches 2;
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98.8%;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Best Local Similarity 98.8
Matches 164; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          166 AA;
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Gaps

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Length 166; Indels

Score 863; DB 22; Pred. No. 8.2e-70; 0; Mismatches 2;

98.6<del>8</del>; 98.8<del>8</del>;

Best Local Similarity 98.8 Matches 164; Conservative

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Query Match

EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEBETRGKLMSSL 120

HLKRYYCRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166

121

121

61 61 AAU00038 standard; Protein; 166 AA.

RESULT 12

AAU00038 ID AAU0

1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKOLOnFtKEDAALTIY 60

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seq2-49n-51t.rag

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conjugates of the invention exhibiting interferon beta activity
comprise at least one first non-polypeptide group covalently attached
to an interferon beta polypeptide, the amino acid sequence of which
to an interferon beta in at least one introduced
and at least one removed amino acid residue comprising an attachment
group for the first non-polypeptide group. The invention also concerns
creducing the immunogenicity and/or increasing functional in vivo
half-life and/or serum half-life of an interferon beta polypeptide
comprising introducing an amino acid residue constituting an attachment
group for a first non-polypeptide group into a position exposed at the
surface of the protein that does not contain such a group and removing
an amino acid residue constituting an attachment group for a first
con-polypeptide group. The conjugate and a cell culture
with the non-polypeptide group. The conjugate and a cell culture
expressing the mutated polypeptides are useful in the treatment of
disease, especially multiple sclerosis, and for treating mammals having
                                                                                                                                                                                                                                                                                                                                          Human; interferon beta; antibody; multiple sclerosis; gene therapy; viral infection; viral hepatitis; cancer; breast cancer; inflammation; crohn's disease; acute myeloid leukaemia; Hodgkin's disease; ulcerative colitis; immunomodulation; mutant; mutebn; Q49K.
                  EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEBETRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            treating
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      A conjugate exhibiting interferon beta activity useful for trea multiple sclerosis comprises a non-polypeptide group covalently attached to an interferon beta polypeptide -
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                sequence represents Human interferon beta mutant Q49K
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        /note- "Wild-type Gln replaced with Lys"
                                                                                           121 hlkryygrilhylkakeyshcawtivrveilrnfyfinrltgylrn 166
                                                                      HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Bornaes C,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Andersen KV,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Location/Qualifiers
                                                                                                                                                                                                AAU00074 standard; Protein; 166 AA
                                                                                                                                                                                                                                                                                                        Human interferon beta mutant Q49K.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Claim 11; Page - ; 108pp; English.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  99DK-0001197.
99US-0160782.
99DK-0001691.
2000DK-0000194.
2000DK-0000363.
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                                                                                                                                                                                                                                                                     16-MAY-2001 (first entry)
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21-OCT-1999;
26-NOV-1999;
07-FEB-2000;
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                                                                                                                                                                                                                                                                                                                                                                                                                                     Homo sapiens.
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circulating antibodies against interferon beta la or 1b. DNA encoding the mutated proteins may be used for gene therapy. The DNA and proteins can also be used to treat viral infections (e.g viral hepatitis), cancer (e.g. breast cancer), inflammation, Crohn's disease, acute myeloid leukaemia, Hodgkin's disease and ulcerative colitis and for immunomodulation.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               The present invention provides proteins which have interferon-beta (IFN-beta) activity. These analogues are produced so that they are less than 97% identical to human IFN-beta. They are useful in the treatment of multiple sclerosis, cancer, particularly osteosarcoma, basal cell carcinoma, cervical dysplasia, glioma, acute myeloid leukaemia, multiple myeloma, Hodgkin's disease, melanoma, and renal, liver and breast cancers, viral infections, including those caused by hepatitis viruses, pheupes viruses and papilloma viruses, viral encephalitis, cytomegalovirus pneumonia and prophylaxis of rhinovirus, idiopathic pulmonary fibrosis
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Interferon-beta activity; multiple sclerosis; cancer; viral infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Novel interferon-beta activity (IbA) proteins which have greater stability than interferon-beta (IFN-beta) useful for the treatment of IFN-beta related disorders such as multiple sclerosis -
                                                                                                                                                                                                                                                                                                                                                                           61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                        Gaps
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                                                                                                              note: the present sequence is not shown in the specification but idenived from the human interferon beta sequence given in AAU00038
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                                                                                                                                                                                                                      Length 166;
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                                                                                                                                                                                                                                                                                                                                                                                                                                             2,
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Pred. No. 8.2e-70;
0; Mismatches 2;
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Best Local Similarity 98.8
Matches 164; Conservative
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                                                                                                                                                                 166 AA;
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                                                                                                                                                                     Sequence
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Interferon-beta activity; multiple sclerosis; cancer; viral infection;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Novel interferon-beta activity (IbA) proteins which have greater stability than interferon-beta (IFN-beta) useful for the treatment of IFN-beta related disorders such as multiple sclerosis -
                                                                                                                                                                                                                                                                                                     EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                      Gaps
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                                                                                                                                                                                                                  1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQNFtKEDAALTIY
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                                                                                                           Length 166;
                                                                                                                                                   Indels
                                                                                                                                                                                                                                                                                                                                                                  98.6%; Score 863; DB 22;
98.8%; Pred. NO. 8.2e-70;
-1v- 0: Mismatches 2;
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and inflammatory diseases
                                                                                                                                                      Conservative
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                                                                                                                               Similarity
                                          166 AA;
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Matches 164;
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Length 166;

Score 863; DB 22; Pred. No. 8.2e-70;

98.6%;

Query Match Best Local Similarity

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EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
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Search completed: July 29, 2002, 15:42:54 Job time: 230 sec

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                                                                                                                                                                                                   1 MSYNLLGFLQRSSNFQCQKL.....RVEILRNFYFINRLTGYLRN 166
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Copyright (c) 1993 - 2000 Compugen Ltd.
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IVHUII
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seq length: 2000000000
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Match Length
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1: pir1:*
2: pir2:*
3: pir3:*
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A; Molecule type: DNA
A; Residues: 1-187 <-DER>
A; Residues: 1-187 <-DER>
A; Cross-references: GB: V00546; NID:g32735; PIDN:CAA23807.1; PID:g32736
B; Houghton, M.; Eaton, M.A.W.; Stewart, A.G.; Smith, J.C.; Doel, S.M.; Cartlin, G.H.; Nucleic Acids Res. 8, 2885-2894, 1980
A; Title: The complete amino acid sequence of human fibroblast interferon as deduced unA; Reference number: A93706; MUID:81053720
A; Accession: A93706

A; Molecule type: mRNA A; Residues: 1-187 <HOU> A; Cross-references: GB.J00218; GB:K00616; GB:M11029; NID:g184626; PID:g386802 A; Cross-references: GB.J00218; GB:K00616; GB:M11029; NID:g184626; PID:g386802 R; Houghton, M.; Stewart, A.G.; Doel, S.M.; Emtage, J.S.; Eaton, M.A.W.; Smith, J.C.; Nucleic Acids Res. 8, 1913-1931, 1980 A; Title: The amino-terminal sequence of human fibroblast interferon as deduced from r A; Reference number: A93700; MUID:81053854

A; Molecule type: mRNA A; Residues: 1-68 <HO2>

interferon alpha-M

trophoblast interf trophoblast protes

Interferon alpha-5 Interferon alpha-7 Interferon-alpha-J

IVHUA7 CVHUA0

30	239.5	27.4	195 189	7	I47097 IVHUA9	trophoblast protei
32	238	27.2	189	(	IVHU14	interferon alpha-I
34	237	27.1	195	4 C	156314 A61403	interieron-alpha - interferon alpha-ī
35	237	27.1	195	~	A53746	interferon, tropho
36	237	27.1	195	~ ~	146398	1 phe
) or	237	27.1	1001	4 0	3/0011 146974	interieron type 1
0 m	236.5	27.1	189	1 (	151970	interferon precurs
40	236.5	27.1	195	~	A39505	trophoblast interf
41	236.5	27.1	195	7	S23751	
42	235.5	56.9	195	7	147066	(1)
43	235	26.9	195	7	146397	interferon alpha -
4 4 4 5 5	235	26.9 26.9	195 195	00	146975 146972	interferon-omega20 interferon-omega44
					ALIGNMENTS	
RESULT TVHUB1	п					
interferon beta-1	on beta		ursor (	val	precursor (validated) - human	
C; Specie	S: HOMO	sapien	s (man)			
C;Date:	18-Aug-	.1982 #s	equence	re	C;Date: 18-Aug-1982 #sequence_revision 18-Aug-1982 #text_change 08-Dec-2000	
R: Lawn,	R.M.: A	delman.	J.: Fr	ank	#00; A33223; A33700; A337	Gross, M. Natarian, R. Goedde
Nucleic	Acids R	kes. 9,	1045-10	52,	Nucleic Acids Res. 9, 1045-1052, 1981	majarram, m.,
A; Title:	Human	fibroble	ast int	erf	eron gene lacks introns.	
A; Reference number:	ince num	ber: A9	3721; M	UID	:81198952	
A Moless	LOUI: AS	15/21 DMA				
A:Residues: 1-187 <law></law>	es: 1-1	87 < LAW	^			
A; Cross-	referen	ces: GB	:V00535	z	A; Cross-references: GB: V00535: NID: q32639: PIDN: CAA23796.1:	1: PID:032640
R; Ohno, S.; Taniguchi,	S.; Tan	iguchi,	П.			
Proc. Na	tl. Aca	id. Sci.	U.S.A.	78	1981	
A; Title:	Struct	ure of	a chrom	oso	A; Title: Structure of a chromosomal gene for human interf	interferon beta.
A:Accession: A93887	100 . AQ	13887	2007			
A; Molecule type: DNA	le type	DNA:				
A; Residu	es: 1-1	.87 <ohn:< td=""><td>^</td><td></td><td></td><td></td></ohn:<>	^			
R; Taniguchi, T.; Ohno, S.;	chi, T.	; Ohno,		111	Fujii-Kuriyama, Y.; Muramatsu, M.	. Σ
Gene 10,	11-15,	1980				
A; Title:	The nu	cleotid	e sednence	nce	of human fibroblast interferon	rferon cDNA.
A; Reference number: A91468; MUID	ince num	ber: A9	1468; M	din	:81005095	
A; Accession	lon: Ay	T408				
A:Residues: 1-187 <tan></tan>	es: 1-1	S MINNER	^			
A:Cross-	referen	ces: GB	:V00546		A:Cross-references: GB:V00546: NID:032735: PIDN:CAA23807.	1: PID:032736
R; Derync	k, R.;	Content	J., D	G.	R; Derynck, R.; Content, J.; DeClercq, E.; Volckaert, G.; Tavernier, J.;	Tavernier, J.; Devos, R.; Fi
Nature 2	85, 542	1-547, 1	980			
A; Title: Isolation and structure of	Isolat	ion and	struct	ure	of a human fibroblast interferon	terferon gene.
A; Kerere	ince num	Der: A9	3225; M	O I E	A; Keierence number: A93225; MUID:80254542 A:Acceston: A03225	
A; Molecule type: DNA	le type	DNA				

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interferon beta-I precursor
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          Nature 249, Dub-607, 1984

Nature 249, Dub-607, 1984

Nature 249, Dub-607, 1984

Nature 249, Seference number: A5344, WILD:8312083

A;Contents: annotation; disulfide bond
R;Shepard H.M.; Leung, D.; Stebbing, N.; Goeddel, D.V.
Nature 244, 563-565, 1981

Nature 244, 563-565, 1981

A;Attle: A shalpde amino acid change in IFN-beta-1 abolishes its antiviral activity.

A;Reference number: A93269; Mulb:82080683

A;Residuas: 1161, Y., 165-187

A;Residuas: Soldy)

A;Retence number: Soldy9

A;Retuas: Dretliminary

A;Retence number: Soldy9

A;Retuas: Dretliminary

A;Retence number: Soldy19

A;Retuas: Dretliminary

A;Retence number: Soldy9

A;Retuas: Dretliminary

A;Retence number: 156315; MUD:8603565

A;Status: prelliminary; translated from GB/EMBL/DDBJ

A;Retuas: Dretliminary; translated from GB/EMBL/DBJ

A;Retuas: Dretualist signal sequence setatus predicted 4SIG>

C;Reywordes: antivital

F;1-27,Domanis: signal sequence setatus predicted

F;1-27,Domanis: Signal sequence setatus predi
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C; Species: Bos primigenius taurus (cattle)
C; Spate: 15-Nov-1984 #sequence_revision 15-Nov-1984 #text_change 07-Feb-1997
R; Leung, D.W.; Capon, D.J.; Goeddel, D.V.
Bio/Technology 2, 458-464, 1984
A; Reference number: A90097
A; Reference number: A90097
A; Recession: A01840
A; Molecule type: DNA
A; Residues: 1-186 < LEU>
C; Superfamily: interferon alpha
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           82 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match 98.9%; Score 864; DB 1; L. Best Local Similarity 98.8%; Pred. No. 3.7e-63; Matches 164; Conservative 0; Mismatches 2;
606-607, 1981
289,
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interferon beta-3 precursor - bovine
C;Species: Bos primiqenius taurus (cattle)
C;Species: LS-Nov-1984 #sequence_revision 15-Nov-1984 #text_change 07-Feb-1997
C;Accession: A01841
R;Leung, D.W.; Capon, D.J.; Goeddel, D.V.
R;Leung, D.W.; Capon, D.J.; Beadd, D.V.
A;Tille: The structure and bacterial expression of three distinct bovine interferon-b A;Reference number: A90097
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Ni Alternate names: EgirN-beta- it type I interferon
C.Specios: Equus caballus (domestic horse)
C.Specios: Equus caballus (domestic horse)
C.Specios: Equus caballus (domestic horse)
C.Accession: G24912
R.Himmler, A.; Hauptmann, R.; Adolf, G.R.; Swetly, P.
DNA 5, 345-356, 1986
A.Title: Molecular cloning and expression in Escherichia coli of equine type I in A.Recession: G24913
A.Accession: G24915
A.Molecule type: mRNA
A.Residues: 1-186 (AINA
A.Residues: 1-186 (AINA
A.Residues: 1-186 (AINA
C.Superfamily: interferon alpha
C.Reywords: antiviral; glycoprotein
F;1-21/Domain: signal sequence #status predicted <SIG>F;2-186/Product: interferon beta-I #status predicted <MAT>F;101,136/Psinding site: carbohydrate (Asn) (covalent) #status predicted
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          SYNLLGFLORSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYE 61
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C;Keywords: glycoprotein
F;1-21/Domain: signal sequence #status predicted <SIG>
F;1-21/Domain: signal sequence #status predicted <WAT>
F;22-186/Product: interferon beta-2 #status predicted <WAT>
F;52-161/Disulfide bonds: #status predicted
F;131,173/Binding site: carbohydrate (Asn) (covalent) #status predicted
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                                                                                                                                                                                                                                                                                                                                                                                                                                            Query Match 55.2%; Score 482.5; DB 1; Best Local Similarity 56.7%; Pred. No. 3.4e-32; Matches 93; Conservative 30; Mismatches 40;
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seq2-49n-51s.rpr

ų

chromosomal fragment containing

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A; Residues: 1-182 <KUG>
A; Cross references: EMBL:X14455; NID:951538; PIDN:CAA32625.1; PID:951539
A; Cross references: EMBL:X14455; NID:951538; PIDN:CAA32625.1; PID:951539
J. Biol. Chem. 258, 9522-9529, 1983
A; Pitle: Structure and expression of a cloned cDNA for mouse interferon-beta.
A; Reference number: A01839; MUID:83265757
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               C; Superfamily: interferon alpha
C; Seywords: glycoprotein
F;1-21/Domain: signal sequence #status predicted <SIG>
F;22-182/Product: interferon beta #status predicted <MAT>
F;50,90,97/Binding site: carbohydrate (Asn) (covalent) #status predicted
J. Mol. Biol. 204, 221-231, 1988
A;Title: Structure and characterization of a murine chromosomal fragment A;Reference number: S02020; MUID:89125582
A;Accession: S02020
A;Molecule type: DNA
A;Residues: 1-182 <VVOD>
A;Cross-references: EMBL:X14029; NID:951550; PIDN:CAA32190.1; PID:951551
R;Kuga, T.; Fujita, T.; Tanlguchi, T.
Muchelc Asid8 Ress. 17, 3291, 1989
A;Title: Nucleotide sequence of the mouse interferon-beta gene.
A;Reference number: S04201; MUID:89263735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A; Molecule type: mRNA
A;Residues: 1-182 <HIG>
A;Cross-references: GB:K00020; NID:g194113; PIDN:AAA37891.1; PID:g309327
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                37.68;
                                                                                                                                                                                                                                                                                                                                                                                                                                                            A; Status: translation not shown
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                                                                                                                                                                                                                                                                                                                                                                                                                          A; Accession: S04201
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C;Species: Mus musculus (house mouse)
C;Bate: 03-Aug-1984 #sequence_revision 03-Aug-1984 #text_change 22-Jun-1999
C;Accession: S02020; S04201; A01839
R;Vodjdani, G.; Coulombel, C.; Doly, J.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Species: Bos primigenius taurus (cattle)
Date: 15-Nov-1984 #sequence_revision 15-Nov-1984 #text_change 07-Feb-1997
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62 MLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLH 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           62 MLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLH 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          61
                                                                            A;Residues: 1-186 <LEU>
(S.Superfamily: interferon alpha
C;Superfamily: interferon alpha
C;Keywords: glycoprotein
F;1-21/Domain: signal sequence #status predicted <SIG>
F;2-186/Product: interferon beta-3 #status predicted <MAT>
F;52-161/Disulfide bonds: #status predicted
F;131,173/Binding site: carbohydrate (Asn) (covalent) #status predicted
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        2 SYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              2 SYNLIGELQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYE
                                                                                                                                                                                                                                                                                                                                                                                                                      Length 186;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            49.3%; Score 430.5; DB 1; Length 186; 50.3%; Pred. No. 5.7e-28;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    122 LKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              ||:|| :: ||::||: |||:|||: ||||:||:|| ||: ||| ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: ||: |
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                                                                                                                                                                                                                                                                                                                                                                                                                  DB 1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        45;
                                                                                                                                                                                                                                                                                                                                                                                                              ch 51.7%; Score 451.5; DB 1
11 Similarity 52.7%; Pred. No. 1.1e-29;
87; Conservative 34; Mismatches 43
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     interferon beta-1 precursor - bovine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        36;
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Matches 83; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match
Best Local Similarity
Matches 87; Conserv
                                          Molecule type: DNA Residues: 1-186 <LEU>
       A; Accession: A01841
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Query Match
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R;Yokoyama, S.; Ohishi, N.; Shamoto, M.; Watanabe, Y.; Yagi, K.
Biochem. Biophys. Res. Commun. 232, 698-701, 1997
A;Title: Isolation and expression of rat interferon beta gene and growth-inhibitory A;Reference number: JC5424; MUID:97271387
A;Accession: JC5424
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    A;Residues: 1-184 <YOK>
A;Cross-references: DDBJ:D87919; NID:g1616938; PIDN:BAA13502.1; PID:g1616939
C;Comment: This protein exhibits characteristic antiviral and antitumor activities.
                                                                     3;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        interferon beta precursor - rat
C;Species: Rattus norvegicus (Norway rat)
C;Date: 10-Jun-1997 #sequence_revision 18-Jul-1997 #text_change 20-Jun-2000
                                                                                                                                                                                                                                                                        EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                           Gaps
                                                                                                                                    MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                                          22 INYKQLQLQERTNIRKCQELLEQLNGKIN--LTYRADFKIPMEM--TEKMQKSYTAFAIQ 77
                                                                     .;
      Length 182;
                                                                     Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        A;Gene: IFNbeta
C;Superfamily: interferon alpha
F;1-21/Domain: signal sequence #status predicted <SIG>
F;22-184/Product: interferon beta #status predicted <MAT>
Query Match 38.5%; Score 336.5; DB 1; Best Local Similarity 45.8%; Pred. No. 2.4e-20; Matches 76; Conservative 26; Mismatches 59;
```

Length 184;

DB 2;

Score 328.5;

Gaps

Length 195;

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91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
                                                                                                                                                                                                                                                                                                                                                                                                      31 CLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLAN 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              5 LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFSKEDAALTIYEMLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         40 LLGOMRRISPES--------CLKDRNDFGFPQEVFDGNQFRKPQAISAVHETIQ
                                 F;1-23/Domain: signal sequence #status predicted <SIG>F;24-195/Product: interferon alpha-ir.1 #status predicted <MAT>F;24-112,52-162/Disulfide bonds: #status predicted F;101/Binding site: carbohydrate (Asn) (covalent) #status predicted
                                                                                                                                                                                                                             Query Match
30.1%; Score 263; DB 1;
Best Local Similarity 40.3%; Pred. No. 2.4e-14;
Matches 54; Conservative 26; Mismatches 54
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   29.4%; Score 257; DB 1;
36.0%; Pred. No. 6.7e-14;
ative 28; Mismatches 54
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         - horse
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Best Local Similarity 36.0 Matches 54; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           172 MRSFSSSANLOGRL 185
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               151 LRNFYFINRLTGYL 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    RESULT 11
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N.Alternate names: EqIFN-alpha-II-2; EqIFN-omega-2; type I interferon
C:Species: Equus caballus (domestic horse)
C:Date: 28-Dec-1987 #sequence_revision 28-Dec-1987 #text_change 22-Jun-1999
C;Accession: F24912
R:Humler, A.; Hauptmann, R.; Adolf, G.R.; Swetly, P.
DNA 5, 345-356, 1986
A:Title: Molecular cloning and expression in Escherichia coli of equine type I interferc
A:Reference number: A90956; MUID:87053170
A:Reference number: A90956; MUID:87053170
A:Residues: 1-195 < HIM>
A:Cross-references: GB:M4545; NID:9164217; PIDN:AAA30949.1; PID:9164220
C;Superfamily: interferon alpha
C;Superfamily: alterferon alpha
C;Superfamils: signal sequence #status predicted <AIG>
F:24-123,52-162/Disulfide bonds: #status predicted
F:101/Binding site: carbohydrate (Asn) (covalent) #status predicted
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Nyalternate names: EqIFN-alpha-II-1; EqIFN-omega-1; type I interferon
C;Species: Equus caballus (domestic horse)
C;Species: Equus caballus (domestic horse)
C;Date: 28-Dec-1987 #sequence_revision 28-Dec-1987 #text_change 22-Jun-1999
C;Accession: E24912
R;Himmler, A.; Haupthmann, R.; Adolf, G.R.; Swetly, P.
By Himmler, A.; Haupthmann, R.; Adolf, G.R.; Swetly, P.
By A; 45-336, 1986
A;Title: Molecular cloning and expression in Escherichia coli of equine type I interferch
A;Reference number: A90956; MUID:87053170
A;Accession: E24912
A;Accession: E24912
A;Accession: E24912
A;Accession: E24912
A;Residues: 1-195 cHIM>
A;Residues: 1-195 cHIM>
A;Cession: Ab A;Cess
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                                                                                                                                                                                                                                                    61 EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                        80 VMLQNVFLVFRSNFSSTGWNETIVESLLDELHQQTELLEIIIKEK-QEERLTWVTSTTTL 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                62 MLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLH 121
                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Gaps
                                                                                                                      MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                              22 IDYKQLQFRQSTSIRTCQKLLRQLNGRLN--LSYRTDFKIPMEVMHPSQMEKSYTAFAIQ 79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      2 SYNLLGFLORSSNFOCOKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYE 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                32.5%; Score 284; DB 1; Length 195; 36.6%; Pred. No. 4.7e-16;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   57; Indels
                                                              Indels
                                                                                                                                                                                                                                                                                                                                                                              121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                   122 LKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLR 165
                   No. 1.1e-19;
smatches 65;
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                                                              Mismatches
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                             Pred.
45.2%; Pic. 23;
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Matches 60; Conservative
                                                           Conservative
                             Best Local Similarity
Matches 75; Conserv
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equine type I interf

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Gaps 64 85

14;

Indels

54;

Length 184;

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interferon alpha-I-3 precursor - horse
N;Alternate names: EqIFN-alpha-I-3; type I interferon
C;Species: Equue caballus (domestic horse)
C;Species: 28-Dec-1987 #sequence_revision 28-Dec-1987 #text_change 18-Jun-1999
C;Accession: C24912
C;Accession: C24912
Bugpmann, R.; Adolf, G.R.; Swetly, P.
DNA 5, 345-356, 1986
A;Title: Molecular cloning and expression in Escherichia coli of equine type I interf
A;Reference number: A90956; MUID:87053170
                                                  86 QIFHLESTDGSSAAWDESLLDKLYTGLYQQLTELEACLSQEVGVEETPLMNEDSLLAVRR 145
65 NIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKR 124
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A;Title: Molecular cloning and expression in Escherichia coli of equine type I interf
A;Reference number: A90956; MUID:87083170
A;Accession: B24912
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K;Gren, E.; Berzin, V. M.; Jansone, I.; Tsimanis, A.; Vishnevsky, Y.; Apsalons, U.
J. Interferon Res. 4, 609-617, 1984
A;Title: Novel human leukocyte interferon subtype and structural comparison of alpha
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           A;Cross-references: GB:X02957; NID:g32653; PIDN:CAA26703.1; PID:g758077
R;Torczynski, R.M.; Fuke, M.; Bollon, A.P.
Proc. Natl. Acad. Sci. U.S.A. 81, 6451-6455, 1984
A;Title: Human genomic library screened with 17-base oligonucleotide probes yields A;Reference number: A22068; MUID:85038533
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N;Alternate names: HuIrN-alpha-I-16; interferon alpha-I-WA; type I interferon
C;Species: Homo sapiens (man)
C;Date: 28-Dec-1987 #sequence_revision 28-Dec-1987 #text_change 18-Jun-1999
C;Accession: G23753; A22068; I73334
R;Henco, K.; Broaius, J.; Pujisawa, A.; Fujisawa, J.I.; Haynes, J.R.; Hochstad
J. Mol. Biol. 185, 227-260, 1985
A;Title: Structural relationship of human interferon alpha genes and pseudogen
A;Reference number: A92916; MUID:86037205
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      40 LLGQMRRISPFS-------CLKDRNDFGFPQEVFDGNQFRKPQAISAVHETIQ 85
                                                                                                                                                                            A; Molecule type: DNA
A; Residues: 1-184 <HIM>
A; Residues: 1-184 <HIM>
A; Cross-references: GB:MI4541; NID:g164218; PIDN:AAA30950.1; PID:g164221
C; Superfamily: interferon alpha
C; Keywords: antiviral
F;1-23/Domain: signal sequence #status predicted <SIG>
F;24-184/Product: interferon alpha-I-2 #status predicted <MAT>
F;24-122,52-162/Disulfide bonds: #status predicted
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A;Residues: 1-189 <RES>
A;Cross-references: GB:M28585; NID:g184643; PIDN:AAA36042.1; PID:g306913
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          5 LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnF9KEDAALTIYEMLQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     Length 184;
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A;Cross-references: GDB:136357; OMIM:147580
A;Map position: 9p22-9p22
A;Introns: #status absent
                                 R;Himmler, A.; Hauptmann, R.; Adolf, G.R.;
DNA 5, 345-356, 1986
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A; Accession: 173334
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A; Residues: 1-189 <HEN>
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A; Residues: 1-189 <TOR>
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N/Alternate names: EgIFN-alpha-I-1; type I interferon
C; Species Equue caballus (domestic horse)
C; Date: 28-Dec-1987 #sequence_revision 28-Dec-1987 #text_change 18-Jun-1999
C; Accession: A.4912
R; Himmler, A.; Hauptmann, R.; Adolf, G.R.; Swetly, P.
DNA 5, 345-356, 1986
A;Title: Molecular cloning and expression in Escherichia coli of equine type I interfere
A; Reference number: A90956; MUID:87033170
A; Accession: A.44912
A; Molecule type: DNA
A; Residues: I-184 < HINA
A; Residues: I-184 < HINA
A; Residues: I-184 < HINA
A; Cross-references: GB:M14540; NID:9164226; PIDN:AAA30953.1; PID:9164227
C; Superfamily: interferon alpha
C; Superfamily: antiviral
F; I-23/Domain: 9ignal sequence #status predicted <SIG>F; 24-184, /Product: interferon alpha-I-1 #status predicted
F; 24-122, 52-162/Disulfide bonds: #status predicted
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N;Alternate names: EqIFN-alpha-I-2; type I interferon
C;Species: Equus caballus (domestic horse)
C;Date: 28-Dec-1987 #sequence_revision 28-Dec-1987 #text_change 18-Jun-1999
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             65 NIFAIFRODSSSTGWNETIVENLLANVYHOINHLKTVLEEKLEKEDFTRGKLMSSLHLKR 124
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   LIGFLORSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQ 64
                                                                                      NID:9164222; PIDN:AAA30951.1; PID:9164223
                                                                                                                                                                                                                                                                                                                                                                                                                                                      5 LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnF9KEDAALTIYEMLQ
                                                                                                                                                                                                                                                                                                                                    Length 184;
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                                                                                                                                                                                                                                                                                                                                                                                              54; Indels
                                                                                                                                                                         F;1-23/Domain: signal sequence *status predicted <SIG>F;24-184/Product: interferon alpha-I-3 *status predicted F;24-122,52-162/Disulfide bonds: *status predicted
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                                                                                                                                                                                                                                                                                                                           Query Match
29.4%; Score 257; DB 1;
Best Local Similarity 36.0%; Pred. No. 6.7e-14;
Matches 54; Conservative 28; Mismatches 54
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                                                    A) Residues: 1-184 (HIM)
A) Cross-references: (B:M14542; B) C; Superfamily: interferon alpha C; Keywords: antiviral
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Best Local Similarity
Matches 54; Conserv
                                 A; Molecule type: DNA
A; Accession: C24912
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Rigren, E.Y.; Berzin, V.M.; Tsimanis, A.Y.; Apsalon, U.R.; Vishnevskii, Y.I.; Yansone, A.; Lozha, V.P.; Kavsan, V.M.; Efimov, V.A.; Sverdlov, E.D.
Dokl. Biochem. 269, 91-95, 1983
A;Title: A new type of leukocytic interferon.
A;Reference number: 137583
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    C;Species: Homo sapiens (man)
C;Date: 04-Oct-1996 #sequence_revision 04-Oct-1996 #text_change 16-Jul-1999
C;Accession: 137584
                                                                                                                                                                                                                                                                                                             GWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKE 137
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                                                                                                                                                                                       20 LLWQLNGRLEY--CLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQNIFAIFRQDSSST 77
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A;Molecule type: mRNA
A;Residues: 1-189 <RES.
A;Cross-references: EMBL:X00140; NID:932726; PIDN:CAA24970.1; PID:932727
C;Superfamily: interferon alpha
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Best Local Similarity 35.8%; Pred. No. 2.3e-13;
Matches 53; Conservative 30; Mismatches 62; Indels 3
                                                                                      28.7%; Score 250.5; DB 1; Length 189; 35.8%; Pred. No. 2.3e-13; 1ve 30; Mismatches 62; Indels 3
F;24-189/Product: interferon alpha-I-16 #status predicted <MAT> F;24-122,52-162/Disulfide bonds: #status predicted
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Best Local Similarity 35.8%
Matches 53; Conservative
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Search completed: July 29, 2002, 15:43:56 Job time: 207 sec

138 YSHCAWTIVRVEILRNFYFINRLTGYLR 165 

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Title: Perfect score:

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P79228 odocoileus
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Eukaryota, Metazoa; Chordata, Craniata, Vertebrata, Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Cercopithecidae;
Cercopithecinae; Macaca.
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Infection.",
Hum. Gene Ther. 10:429-429(1999).
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Matheux F., Le Grand R., Rousseau V., De Maeyer E., Dormont D.,
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Last annotation update)
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HSSP; PO1574; 1AU1.
InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
PRINTS; PR00266; INTERFERONB.
ProDom; PD000550; Interferon_abd; 1.
SMART; SM00076; IFabd; 1.
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Q9PWI6
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  Antiviral; Cytokine.
SEQUENCE 187 AA;
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03168 homo sapien
02845 oryctolagus
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875
1 MSYNLLGFLQRSSNFQCQKL.....RVEILRNFYFINRLTGYLRN 166
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                         GenCore version 4.5
Copyright (c) 1993 - 2000 Compugen Ltd
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Maximum Match 100%
Listing first 45 summaries
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1: Sp_archea:*
2: sp_bacteria:*
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5: sp_invertebrate:*
5: sp_mammal:*
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sp_unclassified:*
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Score 821; DB 6; Length 187; Pred. No. 1e-63;

93.8%; 92.8%;

Query Match Best Local Similarity

22266 MW; 376AEF73332B7807 CRC64;

821 816 816 825 84.5 244.5 244.5 244.5 244.5 244.5 244.5 244.5 244.5 243.5 236

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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
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                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.

MEDIINE-92348930; PubMed=1640116;

Artursson K., Gobl A., Lindersson M., Johansson M., Alm G.;

"Molecular cloning of a gene encoding porcine interferon-beta.";

J. Interferon Res. 12:153-160(1992).

-1- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Chung Y.G., Seidel G.E. Jr.;
"Cloning bovine interferon-tau genes and characterizing their transcriptional expression during early pregnancy.";
Submitted (FEB-2000) to the EMBL/GenBank/DDBJ databases.
--- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Length 186;
                                                                                                                                                                      SEQUENCE FROM N.A.
Artursson K., Gobl A., Lindersson M., Johansson M., Alm
Submitted (FEB-1992), to the EMBL/GenBank/DDBJ databases.
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5F16B8B3C3AE603D CRC64;
                                                                                              Eukaryota, Metazoa, Chordata, Craniata, Vertebrata,
Mammalia, Eutheria, Cetartiodactyla, Suina, Suidae,
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01-WAR-2001 (TrEMBLrel. 16, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
(TrEMBLrel. 01, Created)
(TrEMBLrel. 01, Last sequence update)
(TrEMBLrel. 17, Last annotation update)
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Pfam; PF00143; interferon; 1.
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EMBL; S41178; AAB22723.1; -.
HSSP; P01574; 1AU1.
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                                                          INTERFERON-BETA-1 PRECURSOR
Sus scrofa (Pig).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PRELIMINARY;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    22 1
186 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Best Local Similarity
Matches 101; Conserv
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                                                                                                                                        NCBI_TaxID=9823;
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01-NOV-1996 (
01-NOV-1996 (
01-JUN-2001 (
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SEQUENCE
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Q9GLL5;
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                                                                                                                                    82 EMEQNIXAIFRQDESSTGWNETIVENELANVYHQIDHEKTILEEKEREKEKEKEVSSE 141
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                                      1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIY 60
                                                          22 MSYNLLGFLQRSSSFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQPQQFQKEDAALTIY 81
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MEDLINE-83065590; PubMed-6183692;
Fiders W., Remaut E., Devos R., Cheroutre H., Contreras R.R.,
Gheysen D., Degrave W.M., Stanssens P., Tavernier J., Taya Y.,
Content J.;
The human fibroblast and human immune interferon genes and their
expression in homologous and heterologous cells.";
Philos. Trans. R. Soc. Lond., B. Blol. Sci. 299:29-38(1982).
-- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                              Homo sapiens (Human).
Eukaryota; Metazos; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
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  Indels
                                                                                                                                                                                            121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                            142 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFFFINKLTGYLRN 187
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DBEE65B694862061 CRC64;
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Last annotation update)
5;
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PRINTS; PR00266; INTERFERONAB.
ProDom: PD000550; Interferon_abd; 1.
SMART; SM00076; IFabd; 1.
PR0SITE; PS00222; INTERFERON_A_B_D; UNKNOWN_1.
Antiviral; Cytokine; Signal.
SIGNAL.
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7; Mismatches
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                                                                                                                                                                                                                                                                                                                                                                      Created)
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01-NOV-1996 (TrEMBLrel. 01,
01-DEC-2001 (TrEMBLrel. 19,
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Conservative
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Matches 154;
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Gaps

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64 QNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKT-----VLEEKLEKEDFTRGKL 116
99 AWDETLLDKFYIELFQQLNDLEACVTQEVGVEEIALMNEDSILAVRKYFQRITLYLMGKK 158
                                                                                                                                                                                                                                                                                                                                                                 Austruy E., Bagnis C., Carbuccia N., Maroc C., Birg F., Dubreuil P., Mannoni P., Chabannon C.;

"A defective retroviral vector encoding human interferon alpha 2 can transduce human leukemic cell lines.";

Cancer Gene Ther. 5:247-256(1998).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           LLAQMRRISLFS-------CLKDRHDFGFPQE--EFGNQFQKAETIPVLHEMI 83
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_TaxID=9606;
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostoml;
Mammalia; Eutheria; Lagomorpha; Leporidae; Oryctolagus.
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-!- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              31;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             27.9%; Score 244.5; DB 4; Length 188; 35.3%; Pred. No. 9.3e-14; ive 26; Mismatches 53; Indels 31
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         84 QQIFNLFSTKDSSAAWDETLLDKFYTELYQQLNDLEACVIQGVGVTETPLMKED-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -SILAVRKYFQRITLYLKEKKYSPCAWEVVRABIMRSFSLSTNLQBSLRS 186
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         117 MSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           MEDLINE-94132653; PubMed-8301151;
Charlier M., L'Haridon R., Boisnard M., Martal J., Gaye
"Cloning and structural analysis of four genes encoding
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   9BAA221D2BFB421D CRC64;
                                                                                                                                                                         01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
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01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
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                               YSHCAWTIVRVEILRNFYFINRLTGYLR 165
                                                 PRT;
                                                                                                                                              PRT;
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                                                                                                                                                                                                                          INTERFERON ALPHA 2 PRECURSOR.
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Best Local Similarity 35.3%
Matches 60; Conservative
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                                                                                                                                             PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                        SEQUENCE FROM N.A.
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SEQUENCE FROM N.A.
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Gren E.Y., Berzin V.M., Tsimanis A.Y., Apsalon U.R., Vishnevskii Y.I.,
Yansone I.V., Dishler A.V., Pudova N.V., Smorodintsev A.A.,
IOVIEV V.I., Steppnov A.N., Feldmane G.Y., Meldrais Y.A., Lozha V.P.,
Kavsan V.M., Efimov V.A., Sverdlov E.D.;
A new type of leukocytic interferon.";
Dokl. Blochem. 269:91-95(1893).
--- SIMILARITY; BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       78 GWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKE 137
                                                                                                                                                                                                                                                                                                                      77 TGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAK 136
                                                                                                                                                                                                                                                                                                                                        98 AAWNTTLLEQLCTGLHQQLDDLDACLGQVMEEKDSALGRWGPILITVKKYFQGIHVYLKKK 157
                                                                                                                                                                                                                            Gaps
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                                                                                                                                                                                                                                                                          20 LLWQLNGRLEY -- CLKDRMNFDIPEEIKQLQnFtKEDAALTIYEMLQNIFAIFRQDSSST 77
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Butaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi, Mammalia, Eutheria, Primates, Catarrhini, Hominidae, Homo.
NCBI_TaxID=9606;
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                                                         PRINTS; PR00266; INTERFERONAB.
ProDom: PD000550; Interferon_abd; 1.
SNART; SM0076; IFADd; 1.
SNART; PS00252: INTERFERON_A_B_D; 1.
Antiviral; Cytokine.
SEQUENCE 195 AA; 22139 MW; 689C2443B203E50A CRC64;
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Last annotation update)
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HSSP, P01563; 2HIE.
InterPro: IPR000471; Interferon_abd.
Pfam; PF00143; Interferon; 1.
PRINTS; PR00266; INTERFERONAB.
PRODOM; P0000550; INTERFERONAB.
PROSITE; P800252; INTERFERON_ABD; 1.
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InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
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EMBL; AF238613; AAG14170.1; -.
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Matches 5
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Matches
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"Cloning, expression and biological activity of a new variant of human interferon alpha identified in virus induced lymphoblastoid cells."; Dev. Biol. 60:111-122(1985).
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SEQUENCE FROM N.A.
CECCACCI A., Aurisicchio L., Ciliberto G., Palombo F., Traboni C.;
Ceccacci A., Aurisicchio L., Ciliberto G., Palombo F., Traboni C.;
"Recombinant cotton-top tamarin interferon: a new tool for a primate hepatitis model.";
Submitted (OCT-1999) to the EMBL/GenBank/DDBJ databases.
EMBL; AJ250196; CAC44125.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           31 CLKDRMNFDIPEEIKQLQnFtKEDAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLAN 90
                                                                                                                                                                                                                                                                                                              Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Platyrrhini; Callitrichidae; Saguinus
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Query Match 27.5%; Score 241; DB 6; Length 189; Best Local Similarity 36.0%; Pred. No. 1.9e-13; Matches 49; Conservative 27; Mismatches 60; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Butele
Mammalia, Butheria, Primates, Catarrhini, Hominidae, Homo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  SEQUENCE FROM N.A.
MEDLINE=86005847; PubMed=2995168;
Cohen S., Velan B., Grosfeld H., Shalita Z., Leitner M.,
Shafferman A.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       INTERFERON-ALPHA.
9E4389CFEC329DBA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        189 AA; 22048 MW; 2AF6F48447BB72B3 CRC64;
                                                                                 01-DEC-2001 (TrEMBLiel. 19, Created)
01-DEC-2001 (TrEMBLiel. 19, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-JUN-2001 (TrEMBLrel. 17, Last annotation update)
               189 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       189 AA.
                                                                                                                                                                                                                                                                           Saguinus oedipus (Cotton-top tamarin).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PROSITE; PS00252; INTERFERON_A_B_D; 1.
Antiviral; Cytokine.
SEQUENCE 189 AA; 22048 MW; 2AF6F48.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  HSSP; P01563; 2HIE.
InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; Interferon; 1.
PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
SWART; SM00076; IFabd; 1.
               PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INTERFERON-ALPHA-J1 (IFN-ALPHA-J1).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            23 PO
189 IN
; 22052 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EMBL; M34913; AAA36039.1; -. HSSP; P01563; 2HIE.
                                                                                                                                                                                                     INTERFERON-ALPHA PRECURSOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        151 LRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             172 MRSFSLSTNLQKGLRS 187
               PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       PRELIMINARY;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Homo sapiens (Human).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                1
24 1
189 AA;
                                                                                                                                                                                                                                                                                                                                                                                           NCBI_TaxID=9490;
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                                                  Q95J77;
01-DEC-2001
                                                                                                                                                                                                                                            IFN-ALPHA.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              RESULT 10
Q14607
               ID DATE OF THE READ OF THE REA
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   65 NIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKR 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A. Cedacci A., Auristochio L., Ciliberto G., Palombo F., Traboni C., Recombinant cotton-top tamarin interferon: a new tool for a primate hepatitis model.", bubmitted (OCT-1999) to the EMBL/GenBank/DDBJ databases.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             31 CLKDRMNFDIPEEIKQLQnFtKEDAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLAN 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                14; Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     5 LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFtKEDAALTIYEMLQ 64
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Primates; Platyrrhini; Callitrichidae; Saguinus
NCBI_TaxID=9490;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   ö
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                                                                                                                                                                                                                                                                                                                                                                                                                              Length 195
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            65; Indels
HSSP; P01563; ZHIE.
InterPro: IPR000471; Interferon_abd.
Pfam; PPF00143; Interferon: 1.
PRINTS; PR000356; INTERFERONAB.
ProDom; PD000556; Interferon_abd; 1.
SMART; SM00076; IFabd; 1.
Antiviral; Oylosin: NTERFERON_A_B_D; 1.
Antiviral; Oylosine.
SEQUENCE 195 AA; 21981 MW; D4DZE3EF5134AESF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            POTENTIAL.
POTENTIAL.
06A45DD2B631C85C CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             01-DEC-2001 (TrEMBLrel. 19, Created)
01-DEC-2001 (TrEMBLrel. 19, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
INTERFERON-ALPHA PRECURSOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  27.9%; Score 244; DB 6;
41.1%; Pred. No. 1.1e-13;
tive 20; Mismatches 53;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               189 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            29; Mismatches
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Saguinus oedipus (Cotton-top tamarin).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            23 PC
189 PC
21937 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   EMBL; AJ250195; CAC44124.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                         Best Local Similarity 41.19
Matches 51; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        54; Conservative
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24 1
189 AA;
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Matches 54; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            151 LRNF 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 172 RRAF 175
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                                                                                                                                                                                                                                                                                                                                                                                                                              Query Match
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095J78;
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EMBL; S69000; AAC60526.1;
HSSP; P01563; 2HIE.
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Best Local S
Matches 46
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Q28845;
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DDT READ BY WELL BY WE
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                                                                                                                  4;
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                                                                                                                                                                                                                                                                                             GWNETIVENLLANVYHQINHLKT-----VLEEKLEKEDFTRGKLMSSLHLKRYYGRIL 130
                                                                                                                                                                                                                                                                                                                                                  99 AWEOSLLEKFSTELYQQLNDLEACVIQEVGVEETPLMNEDFI-----LAVRKYFQRIT 151
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                77 TGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAK 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      AMWNTTLLEQLCTGLQQQLEDLDACLGPVMGEKDSDMGRMGPILITVKKYFHDIHVYLKEK 157
                                                                                                               Gaps
                                                                                                                                                                                                                                  40 LLAQM-GRISPFSCLKDRHEFRFPEEFFDGHQFQKTQAISVLHEMIQQTFNLFSTEDSSA 98
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                IFN-TAU-C3.

Bos taurus (Bovine).

Busaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;

Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;

Bovidae; Bovinae; Bos.
                                                                                                                                                                          LLWOLNGRLE--YCLKDRMNFDIPEEIKQLQnFtKEDAALTIYEMLQNIFAIFRQDSSST
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SEQUENCE FROM N.A.

Chung Y.G., Seldel G.E. Jr.;

CLOSING bovine interferon-tau genes and characterizing their

"Closing bovine interferon during early pregnancy.";

Submitted (FEB-2000) to the EMBL/GenBank/DDBJ databases.

-! SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
FAMILY.
                                                                                                                  17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         3,
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                                                       Length 189;
                                                                                                               Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         53; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    6DB1FAE39BF033FA CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Last sequence update)
Last annotation update)
                                                       DB 4;
                                                                                                               58;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Score 238.5; DB 6;
Pred. No. 3.2e-13;
                                                 ; Score 240.5; DB 4; Pred. No. 2.1e-13; 22; Mismatches 58
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   195
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InterPro; IPRO00471; Interferon_abd.
Pfam; PPO0143; interferon; 1.
PRINTS; PR00266; INTERFERONNB.
ProDom; PD000550; Interferon_abd; 1.
SNART; SW00076; IFabd; 1.
Antiviral; Cytokine.
SEQUENCE 195 AA; 22160 MW; 6DB1FAB
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                PRT;
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                                                                             1 Similarity 37.48 58; Conservative
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EYSDCAWEIIRVEMMR 173
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01-MAR-2001 (
01-DEC-2001 (
                                                    Query Match
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Q13168;
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Q9GLL6
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Q13168
ID Q13168
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                                                                                                                                                                                                                                 Zeng O., Li M., Zhou Y., Guo H., Hou Y.;
Zeng O., Li M., Zhou Y., Guo H., Hou Y.;
"The cloning, sequencing of the primary structure and expression in coli Chinese human IRN-W1 gene.";
Sci. China B. 0:0-0(0).
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interferon-
                                                                                                        Homo sapiens (Human).
Bukaryota: Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Primates; Catarrhini; Hominidae; Homo.
NCBI_raxID=9606;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            Oryctolagus cuniculus (Rabbit).
Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi;
Mammalia, Eutheria, Lagomorpha, Leporidae, Oryctolagus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                  Submitted (APR-1995) to the EMBL/GenBank/DDBJ databases.
-!- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA FAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
MEDLINE=94132653; PubMed=8301151;
Charlier M., L'Haridon R., Boisnard M., Martal J., Gaye P.;
Cloning and structural analysis of four genes encoding interferomega in rabbit.";
J. Interferon Res. 13:313-322(1993).
-!- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELIA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           ;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ; Score 236; DB 4; Length 17; Pred. No. 4.6e-13; 32; Mismatches 58; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             B1CC9AB5993016C5 CRC64;
01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
INTERFERON OMEGA-1 (FRAGMENT).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         (TrEMBLrel. 01, Created)
(TrEMBLrel. 01, Last sequence update)
(TrEMBLrel. 19, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           195 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             InterPro; PO1563; 2HIE.

InterPro; IPR000471; Interferon_abd.

R Pfam; PF00143; interferon; 1.

R PRINTS; PR00266; INTERFERONAB.

R PRODOM; PD000550; Interferon_abd; 1.

SMART; SM00076; IFBabd; 1.

Antiviral; Cytokine.

Antiviral; Cytokine.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          174 AA; 20249 MW;
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01-NOV-1996 (TrEMBLrel.
01-DEC-2001 (TrEMBLrel.
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Search completed: July 29, 2002, 15:44:50 Job time: 196 sec
                                                                                                                     PRELIMINARY;
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                                    151 LRNF 154
                                                            172 RRAF 175
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MEDLINE-92039090; PubMed-1937057;
WHALLOY A.E., Carroll R.S., Imakawa K.;
"Cloning and analysis of a gene encoding ovine interferon alpha-II.";
Gene 106:281-282(1991).
                                                                                                                                                                                                             91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
                                                                                                                                                                                                                             91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
                                                                                                                                                                               Gaps
                                                                                                                                                                 31 CLKDRMNFDIPEEIKQLQnFtKEDAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLAN 90
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                                                                                                                                                                                                                                                                                                                                                                                                                          Ovis aries (Sheep).

Eukaryota: Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidea; Caprinee; Ovis.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 -1- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
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                                                                                                                  27.0%; Score 236; DB 6; Length 195; 39.5%; Pred. No. 5.3e-13; Live 20; Mismatches 55; Indels
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Length 195;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                55; Indels
InterPro; IPR000471; Interferon_abd.
Pfam; PR00143; Interferon; 1.
PRINTS; PR00056; INTERFERONAB.
PRODOM; PD000056; Interferon_abd; 1.
SWART; SW00076; IFabd; 1.
SWART; SW0222; INTERFERON_A_B_D; 1.
Antlytal; Cytokine.
SEQUENCE 195 AA; 21996 MW; 395EE700C586A928 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           OVINE INTERFERON ALPHA.
3B8EE700C586A928 CRC64;
                                                                                                                                                                                                                                                                                                                                                                 01-NOV-1996 (TrEMBLrel. 01, Created)
01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
OVINE INTERFERON ALPHA PRECURSOR.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        27.0%; Score 236; DB 6;
ilarity 39.5%; Pred. No. 5.3e-13;
Conservative 20; Mismatches 55;
                                                                                                                                                                                                                                                                                                                                             195 AA
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InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; Interferon; 1.
PRINTS; PR00266; INTERFERONAB.
PRODOM; P0000560; Interferon_abd; 1.
SMART; SM00076; IFRab; 1.
PROSITE; PS00252; INTERFERON_A_B_D; 1.
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                                                                                                                                                                                                                                                                                                                                             PRT;
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                                                                                                                                          Conservative
                                                                                                                                                                                                                                                                                                                                             PRELIMINARY;
                                                                                                                             Best Local Similarity
Matches 49; Conserve
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Best Local Similarity
Matches 49; Conserv
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                                                                                                                                                                                                                                                           151 LRNF 154
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
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01-NOV-1996 (TrEMBLrel. 01, Last sequence update)
01-DEC-2001 (TrEMBLrel. 19, Last annotation update)
11-DEC-2001 (TrEMBLRel. 19, Last an
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195 INTERFERON TYPE I.
22010 MW; 15C4CD45D582F86E CRC64;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          195 AA
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PROSITE; PS00252; INTERFERON_A_B_D; 1.
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Interpro; IPR000471; Interferon_abd.
Pfam; PR00143; Interferon; 1.
PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
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SEQUENCE FROM N.A.
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P01574;
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Copyright (c) 1993 - 2000 Compugen Ltd.
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3.54	36 37	8 6 8 6	40	42	4 4 6 4 3	45

## ALIGNMENTS

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Soeddel D.V., Shepard H.M., Yelverton E., Leung D., Crea R., Sloma A.,
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"The complete amino acid sequence of human fibroblast interferon as deduced using synthetic oligodeoxyribonucleotide primers of reverse transcriptase.";
                                                       21-JUL-1986 (Rel. 01, Created)
21-JUL-1986 (Rel. 01, Last sequence update)
21-JUL-1986 (Rel. 01, Last sequence update)
10-Cor-2001 (Rel. 40, Last annotation update)
10-Cor-2001 (Rel. 40, Last annotation update)
11-JUL-1986 (Rel. 40, Last annotation update)
11-JUL-1986 (Rel. 40, Last annotation update)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     MEDLINE-80254542; PubMed-6157094; Derlynck R., Content J., Declercq E., Volckaert G., Tavernier J., Devos R., Fiers W.;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
MEDLINE-81005095; Pubmed-6157601;
Taniguchi T., Ohno S., Fujii-Kuriyama Y., Muramatsu M.;
"The nucleotide sequence of human fibroblast interferon cDNA.";
Gene 10:11-15(1980).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               MEDLINE-81053720; PubMed-6159580;
Houghton M., Eaton M.A.W., Stewart A.G., Smith J.C., Doel S.M.,
Cartlin G.H., Lewis H.M., Patel T.P., Emtage J.S., Carey N.H.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
Ohno S., Taniguchi T.;
"Structure of a chromosomal gene for human interferon beta.";
Proc. Nath. Acad. Sci. U.S.A. 78:5305-5309(1981).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Pestka S.;
"Synthesis of human fibroblast interferon by E. coli.";
Nucleic Acids Res. 8:4057-4074(1980).
                                                                                                                                                                                                                                                                                                                                                                                                       SEQUENCE FROM N.A.
MEDLINE-81198952; PubMed-6164984;
Lawn R.M., Adelman J., Franke A.E., Houck C.M., Gross Majarian R., Goeddel D.V.;
"Human fibroblast interferon gene lacks introns.";
Nucleic Acids Res. 9:1045-1052(1981).
187 AA
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MEDLINE-81053752; PubMed-6159584;
   STANDARD;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 WWW-"http://www.avonex.com/".
DATABASE: NAME-Betaseron; NOTE-Clinical information on Betaseron;
WWW-"http://www.betaseron.com/Pl.html".
SEQUENCE FROM N.A.
MEDLINE-86035565; PubMed-2414376;
May L.T., Sehgal P.B.;
"On the relationship between human interferon alpha 1 and beta 1
                                                                                                                                                                                                       SEQUENCE OF 1-68 FROM N.A.

MEDLINE-81053854; PubMed-6159597;

MEDLINE-81053854; PubMed-6159597;

MEDLINE-81053854; PubMed-6159597;

Smith J.C., Patel T.P., Lewis H.M., Porter A.G., Birch J.R.,

Cartwright T., Carey N.H.;

"The amino-terminal sequence of human fibroblast interferon as deduced from reverse transcripts obtained using synthetic oligonucleotide primers.";

Nucleic Acids Res. 8:1913-1931(1980).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE OF 71-187 FROM N.A. (VARIANT CLONE PF526).
BEDLINE-820806633; Pubmed-6171/35;
Shepard H.M., Leung D., Stebbing N., Goeddel D.V.;
A single amino acid change in IFN-betal abolishes its antiviral
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         -1- DATABASE: NAME-Avonex; NOTE-Clinical information on Avonex;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       "Assignment of the disulphide bonds of leukocyte interferon."; Nature 289:606-607(1981).
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PROSITE; PS00212; INTERFERON_A_B_D; 1.
Sychythne; Glycoprotein; Antlviral; Signal; Pharmaceutical; 3D-structure. 1 21
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                                                                                                                                                     Interferon Res. 5:521-526(1985)
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MEDLINE-81123083; Pubmed-6162107;
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EMBL; V00535; CAA23796.1; --
EMBL; V00546; CAA23807.1; --
EMBL; V00547; CAA23808.1; --
EMBL; W28622; AAA36040.1; --
PIR; A01838; IVHUB1.
PDB; IAU1; 17-JUN-98.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Murakami Y., Kubota T., Mochizuki M., Kishi M.;
"Gentic structure of feline interferon beta.";
"Submitted (DEC-1998) to the EMBL/GenBank/DDBJ databases.
-i- FUNCTION: HAS ANTIVIRAL, ANTIBACTERIAL AND ANTICANCER ACTIVITIES
                                                                                                                                                                                       0; Gaps
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Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Carnivora, Fissipedia, Felidae, Felis.
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N-LINKED (GECNAC. .) (POTENTIAL).

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-i- SUBUNIT: MONOMER (BY SIMILARITY).
-i- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                            C -> Y (IN CLONE PF526, LOSS OF
TO FORM THE ESSENTIAL DISULFIDE
LOSS OF ANTIVIRAL ACTIVITY).
                                                                                                                                                       Length 187;
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                                                                                           /FTId=VAR_004016.
0B013D4087723CEC CRC64;
                N-LINKED (GLCNAC. ..).
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Pred. No. 6.8e-65;
0; Mismatches 2;
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16-0CT-2001 (Rel. 40, Last sequence update)
16-0CT-2001 (Rel. 40, Last annotation update)
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Pfam; PF00143; interferon; 1.
PRINTS; PR00256; INTERFERONAB.
PRODOM; PD000550; Interferon_abd; 1.
PROSITE; PS00252; INTERFERON_A_B_D; 1.
CYtokine; Antiviral; Glycoprotein; Signal.
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Best Local Similarity 98.8%;
Matches 164; Conservative (
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Biotechnology 2:458-464(1984).
--- FUNCTION: HAS ANTIVIRAL, ANTIBACTERIAL AND ANTICANCER ACTIVITIES.
--- SUBDUNT: MONOMER.
--- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
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Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidae; Bovinae; Bos.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A.
Leung D.W., Capon D.J., Goeddel D.V.;
"The gtructure and bacterial expression of three distinct bovine
N-LINKED (GLCNAC. .) (POTENTIAL).
25C359B1808AC862 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 PROBABLE.
N-LINKED (GLCNAC. . ) (POTENTIAL).
N-LINKED (GLCNAC. . ) (POTENTIAL).
D9F257C6E3250480 CRC64;
                                                                                                                                 1;
                                                                                      Length 186;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SMART; SM00076; IFabd; 1.
PROSITE; PS00252; INTERFERON.A.B.D; 1.
CYLOKine; Glycoprotein; Antiviral; Multigene family; Signal.
1 21
                                                                                                                                 38; Indels
                                                                                                                                                                                                                                                                                                                                                                      141 NLKKYYLRIVRYLKAKEYSVCAWTVVHAEILRNFFFLERLTDYLON 186
                                                                                                                                                                                                                                                                                                                                                121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                      DB 1;
                                                                                  59.1%; Score 516.5; DB 1
60.8%; Pred. No. 3.8e-36;
tive 26; Mismatches 38
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                INTERFERON BETA-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         21-JUL-1986 (Rel. 01, Created)
21-JUL-1986 (Rel. 01, Last sequence update)
01-NOV-1997 (Rel. 35, Last annotation update)
Interferon beta-2 precursor.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              HSSP; PO1574; 1AU1.
InterFro; IPR000471; Interferon_abd.
Pfam; PF00143; Interferon; 1.
PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
136 N.
22187 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Ψ.,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     EMBL; M15478; AAA30580.1; -. PIR; A01840; IVBOB2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                22319
                                                                                                        Best Local Similarity 60.88
Matches 101; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   STANDARD;
136 1
186 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               52
131
173
186 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         A01840;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 INB2_BOVIN
P01576;
CARBOHYD
SEQUENCE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               DISULFID
CARBOHYD
CARBOHYD
                                                                                      Query Match
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INB2_BOVIN
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55.2%; Score 482.5; DB 1; Length 186;

Query Match

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                                                                                                                                                                                                                                       62 MLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLH 121
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        DNA 5:345-356(1986).
-!- FUNCTION: HAS ANTIVIRAL, ANTIBACTERIAL AND ANTICANCER ACTIVITIES.
-!- SUBUNIT: MONOMER.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Gaps
                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         SEQUENCE FROM N.A. MEDIAGE 3022999; MEDIATE 8703170; PubMed 3022999; MEDIATE 8703170; PubMed 8., Adolf G.R., Swetly P.; Molecular cloning and expression in Escherichia coli of equine type
                                                                                                   SYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYE 61
                                                                                                                                 23 SYSLLRFQORRSLALCQKLLRQLPSTPQHCLEARMDFQMPEEMKQAQQFQKEDAILVIYE 82
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eŭkaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Perissodactyla; Equidae; Equus.
NCBL_TaxID=9796;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             -! - SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
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LIJKKED (GLCNAC. . .) (POTENTIAL)

N-LINKED (GLCNAC. . .) (POTENTIAL)

AE9F3ADFC006EE6C CRC64;
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                                                                                                                                                                                                                                                                                                                                             122 LKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLR 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   54.6%; Score 477.5; DB 1;
57.8%; Pred. No. 6.3e-33;
tive 27; Mismatches 42;
                   ed. No. 2.4e-33;
Mismatches 40
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13-AUG-1987 (Rel. 05, Created)
13-AUG-1987 (Rel. 05, Last sequence update)
01-NOV-1997 (Rel. 35, Last annotation update)
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InterPro; IPR00471; Interferon_abd.
Pfam, PF00143; Interferon; 1.

PRINTS, PR00266; INTERPERONAB.
PRODOM; PD000550; Interferon_abd; 1.

SMART; SM00076; IFBabd; 1.

Cytokine; Antiviral; Glycoprotein; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Interferon beta precursor (IFN-beta).
56.7%; Pie-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           21882 MW;
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Best Local Similarity 57.8%
Matches 96; Conservative
                                              Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           Equus caballus (Horse).
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52
101
136
186 AA;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  1;
                                  62 MLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLH 121
                                                                                                                                                                                                                                                                                                                              Interferon-beta genes.";
Biotechnology 2:458-464(1984).
-I- FUNCTION: HAS ANTIVIRAL, ANTIBACTERIAL AND ANTICANCER ACTIVITIES.
-I- SUBBUNIT: MONOMER.
-I- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Gaps
81
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      SYNLIGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYE 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13 SYSLLRFQQRRSAEVCQKLLGQLHSTPQHCLEAKMDFQVPEEMNQAQQFRKEDAILVIYE 82
                                                                                                                                                                                                                            Bos taurus (Bovine).
Sukaryota, Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea;
Bovidae; Bovinae; Bos
22 VNYDLLRSQLRSSNSACLMLLRQLNGAPQRCPEDTMNFQVPEEIEQAQQFQKEDAALVIY
                      EMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSL
                                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A. Leung D.W., Capon D.J., Goeddel D.V.; "The structure and bacterial expression of three distinct bovine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 N-LINKED (GLCNAC. . .) (POTENTIAL)
N-LINKED (GLCNAC. . .) (POTENTIAL)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           DB 1; Length 186;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     HISP, PO1574, 1AUL.
InterPro: IPR000471; Interferon_abd.
Pfam. PF00143; Interferon; 1.
PRINTS; PR00265; INTERPERSONAB.
PRODOM; PD000550; Interferon_abd; 1.
SWART; SW00076; IPRDAG, 1.
CYLOKINE; PS00075; INTERPERSON A_B_D; 1.
CYLOKINE; PS00252; INTERPERSON A_B_D; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  Indels
                                                                1D10111EBEE1A65D CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 43;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             INTERFERON BETA-3.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        51.7%; Score 451.5; DB
52.7%; Pred. No. 9e-31;
ive 34; Mismatches
                                                                                                                                                                             21-JUL-1986 (Rel. 01, Last sequence update) 01-NOV-1997 (Rel. 35, Last annotation update) Interferon beta-3 precursor.
                                                                                                                                                186 AA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROBABLE.
                                                                                                                                                                      01, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        22059 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  EMBL; M15479; AAA30581.1; -. PIR; A01841; IVBOB3.
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                                                                                                                                               STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  131
173
186 AA;
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                                                                                                                                                                   21-JUL-1986 (Rel.
                                                                                                                                                                                                                                                                          NCBI_TaxID-9913;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Query Match
Best Local Simi
Matches 87;
                                                                                                                                                                                                                                                                                                                                                                                     FAMILY.
                                                                                                                                              INB3_BOVIN
P01577;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  CARBOHYD
CARBOHYD
SEQUENCE
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                                                                                                                         RESULT 5
INB3_BOVIN
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     interferon-beta genes.";
Biotechnology 2:458-464(1984).
-1- FUNCTION: HAS ANTIVIRAL, ANTIBACTERIAL AND ANTICANCER ACTIVITIES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     62 MIQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLH 121
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Bovoidea; Bovidae; Bovid
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Leung D.W., Capon D.J., Goeddel D.V.; "The structure and bacterial expression of three distinct bovine
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  -!- SUBUNIT: MONOMER.
-!- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    PROBABLE.
N-LINKED (GLCNAC. . .) (POTENTIAL).
N-LINKED (GLCNAC. . .) (POTENTIAL).
F9060C07EA415B9C CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ij
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Indels
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LKRYYGRILHYLKAKEYSHCAWIIVRVEILRNFYFINRLTGYLRN
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01, Last sequence update)
35, Last annotation update)
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PIR; A01842; IVBOB1.
HSSP, PO1574; 1A01.
INTERPO: IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
PTODOm; PRO00556; INTERFERONAB.
PTODOm; PD000550; Interferon_abd; 1.
SMART; SM00076; IFabd; 1.
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21-JUL-1986 (Rel. 01, Last s
01-NOV-1997 (Rel. 35, Last a
Interferon beta-1 precursor.
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Best Local Similarity 50.3
Matches 83; Conservative
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52
131
173
186 AA;
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P01578;
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INB1_BOVIN
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Query Match
Best Local Simi
Matches 76;
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P70499;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         MEDLINE-92371425; PubMed-1505514; Sonda T., Shimizu H., Astauta K.T., Matsuda Y., Kawano G., Shimizu H., Nakamura K.T., Mitsui Y.; Tructure Y.; Three-dimensional crystal structure of recombinant murine interferon-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     X-RAY CRYSTALLOGRAPHY (2.75 ANGSTROMS).
Senda T., Matsuda S., Kurlhara H., Nakamura K.T., Kawano G.,
Shimizu H., Mizuno H., Mitsui Y.;
"Three-dimensional structure of recombinant murine interferon-beta.";
Proc. Jpn. Acad., B, Phys. Biol. Sci. 66:77-80(1990).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            2.15-A resolution.";
J. Mol. Biol. 253:187-207(1995).
-!- FUNCTION: HAS ANTIVIRAL, ANTIBACTERIAL AND ANTICANCER ACTIVITIES.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        MEDLINE-96028219; PubMed-7473712;
Senda T., Saltoh S.-I., Mitsul Y.;
"Refined crystal structure of recombinant murine interferon-beta at
                                                                                                                        MEDLINE-89125582; PubMed-3221389;
Vodjdani G., Coulombel C., Doly J.;
"Structure and characterization of a murine chromosomal fragment
                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDLINE-88196115; PubMed-3360010;
Cylvas A., Fournet B., Coulombel C., le Roscouet D., Honvault A., Petek F., Montreuil J., Doly J.;
Purification and carbohydrate structure of natural murine
                                                                                                                                                                                                        Higashi Y., Sokawa Y., Watanabe Y., Kawade Y., Ohno S., Takaoka Taniguchi T.;
                                                                                                                                                                                                                                "Structure and expression of a cloned cDNA for mouse interferon-
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           PTM: THIS BETA INTERFERON DOES NOT HAVE A DISULFIDE BOND. SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                             SEQUENCE FROM N.A. MEDILINE-89263735; PubMed-2726460; MEDILINE-89263735; PubMed-2726460; Kuga T., Fujita T., Taniguchi T.; "Nuclecide sequence of the mouse interferon-beta gene."; Nucleic Acids Res. 17:3291-3291(1989).
                                                                    21-JUL-1986 (Rel. 01, Last sequence update)
15-DEC-1998 (Rel. 37, Last annotation update)
Interferon beta precursor (IFN-beta).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              X-RAY CRYSTALLOGRAPHY (2.15 ANGSTROMS)
                                                                                                                                                                                                                                                                                                                                                                                                    containing the interferon beta gene.";
J. Mol. Biol. 204:221-231(1988).
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Eur. J. Biochem. 173:311-316(1988).
                                                                                                                                                                                                                                                      Biol. Chem. 258:9522-9529(1983)
                                                                                                                                                                                             MEDLINE-83265757; PubMed-6688252;
                                                          (Rel. 01, Created)
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                                  STANDARD;
                                                                                                                    Mus musculus (Mouse).
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                                                       21-JUL-1986 (
21-JUL-1986 (
15-DEC-1998 (
                                                                                                         IFNB OR IFB.
                                INB_MOUSE
P01575;
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                    INB_MOUSE
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use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@isb-sib.ch).
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Mammalia; Eutheria; Rodentia; Sciurognathi; Muridae; Murinae; Rattus.
NCBI_TaxID=10116;
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Ω
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                                                                                                                                                                                                                                                                                                                                                                SMART; SM00076; IFabb; 1.
PROSITE; PS00252; INTERFERON_A_B_D; 1.
Cytokine; Glycoprotein; Antiviral; Signal; 3D-structure.
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N-LINKED (GLCNAC. . .).
N-LINKED (GLCNAC. . .).
8C4C32947FD1B917 CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          38.5%; Score 336.5; DB 1;
45.8%; Pred. No. 2.9e-21;
tive 26; Mismatches 59;
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01-NOV-1997 (Rel. 35, Last sequence update)
15-JUL-1998 (Rel. 36, Last annotation update)
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InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
                                                                                                EMBL; K00020; AAA37891.1; --
EMBL; X14455; CAA32625.1; --
EMBL; X14029; CAA32190.1; --
PIR; A01839; IVMSB.
PIR; S02020; S02020;
PDB; ITRA, 31,2AN-94.
PDB; ZHIF; 31.4UG-94.
PDB; IRMI; 14.FEB-95.
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97
22127 MW;
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182 AA;
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SEQUENCE FROM N.A.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      61 EMLONIFAIFRODSSSTGWNETIVENLLANVYHOINHLKTVLEEKLEKEDFTRGKLMSSL 120
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          80 VMLQNVFLVFRSNFSSTGWNETIVESLLDELHQQTELLEIILKEK-QEERLTWVTSTTTL 138
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        SEQUENCE OF 167-195 FROM N.A.
MEDLINE-87053170; PubMed-3022999;
Himmler A., Hauptmann R., Adolf G.R., Swetly P.;
"Molecular cloning and expression in Escherichia coli of equine type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             1 MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIY 60
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   22 IDYKQLQFRQSTSIRTCQKLLRQLNGRLN--LSYRTDFKIPMEVMHPSQMEKSYTAFAIQ 79
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         13-AUG-1987 (Rel. 05, Created)
13-AUG-1987 (Rel. 05, Last sequence update)
13-APR-1988 (Rel. 07, Last annotation update)
10-APR-1988 (Rel. 07, Last annotation update)
11 Interferon omega-2 precursor (Interferon alpha-II-2).
12 Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostom1;
13 Eukaryota; Lutheria; Perissodactyla; Equidae; Equus.
                                                                                                                                                                                                                                                                                                                                                                                    (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                      (GLCNAC. . .) (POTENTIAL). (GLCNAC. . .) (POTENTIAL).
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-1- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          ë,
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  37.6%; Score 328.5; DB 1; Length 184; 45.2%; Pred. No. 1.3e-20;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               121 HLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLRN 166
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   139 GLKSYYWRVQRYLKDKKYNSYAWMVVRAEVFRNFSIILRLNRNFQN 184
                                                                                                                                                                                                                                                                                                                                                                                                                                           1D051D29F979ADDE CRC64;
                                                                                                                                                                                                                                                                                                                                                                                    (GLCNAC. . .)
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                                                                                                                                                                                                                                                                                                                                             INTERFERON BETA.
N-LINKED (GLCNAC...
N-LINKED (GLCNAC...
N-LINKED (GLCNAC...
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Mismatches
                                                                                                                                                                                     InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; Interferon; 1.
PRINTS; PR00256; INTERFERONAB.
PRODOM; PD000550; Interferon_abd; 1.
PROSITE; PS00252; INTERFERON_A_B_D; 1.
CYtokine; Antiviral; Glycoprotein; Signal.
                                                                                                                                                                                                                                                                                                                               BY SIMILARITY
                                                                                                                                                                                                                                                                                                                                                                                                                           N-LINKED
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        23;
                                                                                                                                                                                                                                                                                                                                                                                                                                             22072 MW;
                                                                                                                                                     EMBL; D87919; BAA13502.1; -.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               STANDARD;
                                                                                                                                                                           P01575; 2HIF,
                                                                                                                                                                                                                                                                                                                                                                                                                                           184 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      Best Local Similarity
Matches 75; Conserv
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           I interferons.
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P05002;
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CARBOHYD
CARBOHYD
SEQUENCE
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MEDLINE-87053170; PubMed-3022999;
Himmler A., Hauptmann R., Adolf G.R., Swetly P.;
"Molecular cloning and expression in Escherichia coli of equine type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   2 SYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFSKEDAALTIYE 61
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       37 NEVLIGOMSRISS------AICLKDRKDFRFPQDMADGROFPEAQAASVLHE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Eutheria, Perissodactyla, Equidae, Equus.
NCBI_TaxID=9796,
                                                                                                                                                                                                                                                                                                                                                                                                                                               .) (POTENTIAL).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       I interferons.";
DNA 5:345-356(1986).
-i- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             14;
                                                                                                                                                                                                                                                                                          Cytokine; Glycoprotein; Antiviral; Multigene family; Signal. SIGNAL 1 23
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             32.5%; Score 284; DB 1; Length 195; 36.6%; Pred. No. 6.8e-17;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       57; Indels
                                                                                                                                                                                                                                                                                                                                                                            BY SIMILARITY.
BY SIMILARITY.
N'EINKED (GLCHAC. ..) (P.
; 949DA221AB3C17DF CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   13-AUG-1987 (Rel. 05, Created)
13-AUG-1987 (Rel. 05, Last sequence update)
01-APR-1988 (Rel. 07, Last annotation update)
Interferon omega-1 precursor (Interferon alpha-II-1).
Equus caballus (Horse).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 122 LKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRLTGYLR 165
                                                                                                                                                                                                                                                                                                                                                       INTERFERON OMEGA-2.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       33; Mismatches
                                                                                                       Fig. 10 pt. 10 p
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Pfam; PF00143; interferon; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           22131 MW;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          EMBL; M14544; AAA30955.1; -. EMBL; A15991; CAA01259.1; -. PIR; E24912; IVH021. HSSP; P01563; 2HIE.
                        EMBL; A16557; CAA01293.1;
PIR; F24912; IVHO22.
HSSP; P01563; 2HIE.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             Query Match
Best Local Similarity 36.68
Matches 60; Conservative
EMBL; M14545; AAA30949.1;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             STANDARD;
                                                                                                                                                                                                                                                                                                                                                    195
122
162
101
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                           SEQUENCE
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                 91 VYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEI 150
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              Gaps
                                                                                                                                                                                                                                                                                                                                                                                                     [1]
SEQUENCE FROM N.A.
MEDLINE-87053170; Pubmed-3022899;
Himmler A., Hauptmann R., Adolf G.R., Swetly P.;
"Molecular cloning and expression in Escherichia coli of equine type
                                                                                                                                                                                                                                                                                                                                                                        31 CLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLAN 90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  ACTIVITIES. INTERFERON STIMULATES THE PRODUCTION OF TWO ENZYMES:
A PROTEIN KINASE AND AN OLIGOADENYLATE SYNTHETASE.
SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          Eukaryota, Metazoa, Chordata, Craniata, Vertebrata, Buteleostomi,
Mammalia, Butheria, Perissodactyla, Equidae, Equus.
                                                                                                                                                                                    N-LINKED (GLCNAC. . ) (POTENTIAL).
A81C3CF0A7CA9B6E CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          I interferons.";
DNA 5:345-356(1986).
-I- FUNCTION: PRODUCED BY MACROPHAGES, IFN-ALPHA HAVE ANTIVIRAL.
    Probom; Francis I Problem; Probom; Francis SMORTS; PROSTE; PROSTE; PROSTE; PROSO25; INTERFERON_A_B_D; 1.
PROSITE; PSO0252; INTERFERON_A_B_D; 1.
Cytokine; Glycoprotein; Antiviral; Multigene family; Signal.
SIGNAL 123 INTERFERON OMEGA-1.
DISULFID 24 125 BY SIMILARITY.
DISULFID 52 162 BY SIMILARITY.
DISULFID 52 162 BY SIMILARITY.
DISULFID 52 162 BY SIMILARITY.
                                                                                                                                                                                                                                                                               30.1%; Score 263; DB 1; Length 195; 40.3%; Pred. No. 3.7e-15; ive 26; Mismatches 54; Indels
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PIR; A24912; IVHOA1.
HSSP, P01563; 2HIE.
InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
SMART; SM00076; IFBdd; 1.
PROSITE; PS00252; INTERFERON_A_B_D; 1.
CYCOKINE; PR0121; Multigene family; Signal.
SIGNAL.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  13-MG-1987 (Rel. 05, Created)
13-MG-1987 (Rel. 05, Last sequence update)
01-MMR-1989 (Rel. 10, Last annotation update)
Interferon alpha-1 precursor.
Equus caballus (Horse).
ProDom; PD000550; Interferon_abd; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              PRT;
                                                                                                                                                                                                                                                                                                                             54; Conservative
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               151 LRNFYFINRLTGYL 164
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           172 MRSFSSSANLOGRL 185
                                                                                                                                                                                                                                                                                                     Similarity
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P05003;
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Best Local S
Matches 54,
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                                                                                                                                                                                                                                                                                                                                                                  65 NIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKR 124
                                                                                                                                                                                                  Gaps
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      MEDLINE-87053170; PubMed-3022999;
Himmler A., Hauptmann R., Adolf G.R., Swetly P.;
Molecular caloning and expression in Escherichia coli of equine type interferons."
Interferons.";
DNA 5:345-356(1986).
-!- FUNCTION: PRODUCED BY MACROPHAGES, IFN-ALPHA HAVE ANTIVIRAL ACTIVITIES. INTERFERON STIMULATES THE PRODUCTION OF TWO ENZYMES:
ACTIVITIES. INTERFERON STIMULATES THE PRODUCTION OF TWO ENZYMES:
-!- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA FAMILY.
                                                                                                                                                                                                                                              64
                                                                                                                                                                                                                                         5 LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQ
                                                                                                                                                                                                                                                                       Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Perissodactyla; Equidae; Equus.
NCBI_TaxID=9796;
                                                                                                                                                                                                  14;
                                                                                                                                              Length 184;
                                                                                                                                                                                               54; Indels
  INTERFERON ALPHA-1.
BY SIMILARITY.
BY SIMILARITY.
9E860B8CD05C83E6 CRC64;
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BY SIMILARITY.
4C15D991ECA6D24A CRC64;
                                                                                                                                            29.4%; Score 257; DB 1; 36.0%; Pred. No. 1.1e-14; iive 28; Mismatches 54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         INTERFERON ALPHA-3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  PROSITE; PS00252; INTERFERON_A_B_D; 1.
Cytokine; Antiviral; Multigene family; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13-AUG-1987 (Rel. 05, Created)
13-AUG-1987 (Rel. 05, Last sequence update)
01-MAR-1989 (Rel. 10, Last annotation update)
11-Areferon alpha-3 precursor.
Equus caballus (Horse).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       184 AA.
                                                                                                                                                                                                                                                                                                                                                                                                                                  125 YYGRILHYLKAKEYSHCAWTIVRVEILRNF 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                           PRINTS; PR00266; INTERFERONAB.
ProDom; PD000550; Interferon_abd; 1.
SMART; SM00076; IFabd; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              EMBL; M14542; AAA30951.1; -.
EMBL; A16555; CAA01292.1; -.
PIR; C24912; IVH0A3.
HSSP; CAD1563; 2HIE.
HSSPCO; IPR000471; Interferon_abd.
Pfam; PF00143; Interferon; 1.
  184 II
122 Bi
162 Bi
20808 MW;
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20782 MW;
                                                                                                                                                                                               54; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       STANDARD;
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24 1
52 1
184 AA;
                                                                         184 AA;
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SEQUENCE FROM N.A.
                                                                                                                                                                    Similarity
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P05005;
CHAIN
DISULFID
DISULFID
SEQUENCE
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DISULFID
SEQUENCE
                                                                                                                                                 Query Match
                                                                                                                                                                         Best Local
Matches 5
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INT_CEREL
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                                                             ï
                                                                                                                                                                                                                                                                            65 NIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKR 124
                                                             Gaps
                                                                                                                                                                            85
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         DAMA 5:345-356(1986).
-I- FUNCTION: PRODUCED BY MACROPHAGES, IFN-ALPHA HAVE ANTIVIRAL ACTIVITIES. INTERFERON STIMULATES THE PRODUCTION OF TWO ENZYMES:
A PROTICIL KINASE AND AN OLIGOADENYLATE SYNTHETASE.
-I- SIMILARITY: BELONGS TO THE INTERPERON ALPHA, BETA AND DELTA
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         Himmler A., Hauptmann R., Adolf G.R., Swetly P.,
                                                                                                                  5 LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQ 64
                                                                                                                                                                            LLGOMRRISPFS-------CLKDRNDFGFPQEVFDGNQFRKPQAISAVHETIQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                Bukaryota, Metazoa, Chordata, Craniata, Vertebrata, Euteleostomi,
Mammalia, Butheria, Perissodactyla, Equidae, Equus.
                                                             14;
Length 184;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Length 184;
                                                             54; Indels
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BY SIMILARITY.

FC087F46F11C68EC CRC64;
29.4%; Score 257; DB 1; 36.0%; Pred. No. 1.1e-14; 1ve 28; Mismatches 54;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      INTERFERON ALPHA-4
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Score 257; DB 1;
Pred. No. 1.1e-14;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         PROSITE; PS00252; INTERFERON_A_B_D; 1.
Cytokine; Antlviral; Multigene family; Signal.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              13.AUG-1987 (Rel. 05, Last sequence update) 01-MMR-1989 (Rel. 10, Last annotation update) Interferon alpha-4 precursor. Equus caballus (Horse).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       184 AA
                                                                                                                                                                                                                                                                                                                                                                                           125 YYGRILHYLKAKEYSHCAWTIVRVEILRNF 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HSSP, P01563; ZHIE.
InterPro; IPR000471; Interferon_abd.
Pfam; PP00143; Interferon; I.
PRINTS; PR00266; INTERFEROMAB.
ProDom; PD000550; Interferon_abd; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               SEQUENCE FROM N.A. MEDLINE-87053170; Pubmed-3022999;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         29.4%; Scor
36.0%; Pred
tive 28; 1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     05, Created)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               EMBL; M14543; AAA30952.1; -. PIR; D24912; IVHOA4.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Query Match
Best Local Similarity 36.00
Matches 54; Conservative
                                                             54; Conservative
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             SMART; SM00076; IFabd; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          STANDARD;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         184 AA;
                                 Similarity
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  (Rel.
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       I interferons
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               13-AUG-1987
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    INA4_HORSE
P05006;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      FAMILY
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   Query Match
Best Local 9
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                                                             Matches
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1;

Gaps

14;

54; Indels

Mismatches

64

LLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQ

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PRODUCTION FARACTINE HORBORY INTERACTS WITH EASTONAIDE FOR MATERNAL PROCOGNITION OF PREGNANCY. INTERACTS WITH BROOMETRIAL RECEPTORS, PROBABLY TYPE I INTERFERON RECEPTORS, AND BLOCKS ESTROGEN RECEPTOR EXPRESSION, PREVENTING THE ESTROGEN INDOMETRIAL IN OXYTOCIN RECEPTOR EXPRESSION IN THE ENDOMETRIAL THIS RESULTS IN THE SUPPRESSION OF THE PULSATILE ENDOMETRIAL RELEASE OF THE LUTEOLYTIC HORMONE PROSTAGLANDIN P2-ALPHA, HINDERING THE REGRESSION OF THE CORPUS LUTEOM (LUTEOLYSIS) AND THEREFORE A RETURN TO OVARIAN PROSTAGLANDIN SYMTHESIS, LEADS IN TURN TO CONTINUED OVARIAN PROGESTERONE SECRETION WICH STIMULATES THE SECRETION BY THE ENDOMETRIUM OF THE UNTREDICT SEPECT OF IF HE CONCEPTUS. IN SUMMARY, DISPLAYS PARTICULARLY HIGH ANTIVIRAL AND ANTIPPROLIFFRATIULE POTENTY CONCURRENTLY WITH PARTICULAR WEAK CYTOTOXICITY, HIGH ANTILUTEOLYTIC ACTIVITY AND IMMUNOMODULATORY PROPERTIES. IN CONTRAST WITH OTHER IFNS, IFN-TAU IS NOT VIRALLY
                                                                                                                                                                                                                                                                                                                                                                                                                 30-MAY-2000 (Rel. 39, Last sequence update)
30-MAY-2000 (Rel. 39, Last annotation update)
Interferon tau precursor (IFN-tau) (Trophoblast protein-1) (TP-1)
(Trophoblastin) (Antiluteolysin) (Trophoblast antiluteolytic protein).
                                                                                                                   86 QIFHLESTDGSSAAWDESLLDKLYTGLYQQLTELEACLSQEVGVEETPLMNEDSLLAVRR 145
                                                                       65 NIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLÆEKLEKEDFTRGKLMSSLHLKR 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              -1- SUBCELLULAR LOCATION: SECRETED INTO THE UTERINE LUMEN.
-1- TISSUE SPECIFICITY: CONSTITUTIVELY AND EXCLUSIVELY REPRESSED IN
THE MONOUGLEAR CELLS OF THE EXTRA-EMBRYONIC TROPHECTODERM.
-1- DEVELOPMENTAL STAGE: MAJOR SECRETORY PRODUCT SYNTHESIZED BY THE
CONCEPTUS DURING A VERY SHORT PERIOD IN EARLY PREGNANCY.
-1- MISCELLANBOOUS: IRN-TAU GENES ARE INTROLLESS: THEY EVOLVED FROM
IFN-OMEGA GENES IN THE RUMINANTA SUBORDER AND HAVE CONTINUED TO
DUPLICATE INDEPENDENTLY IN DIFFERENT LINEAGES OF THE RUMINANTAL
THEY ENCODE FOR PROTEINS VERY STHILAR IN SEQUENCE BUT WITH
DIFFERENT BIOLOGICAL POTENCY AND PATTERN OF EXPRESSION.
-1- SIMILARITY: BELONGS TO THE INTERFERON ALPHA, BETA AND DELTA
FAMILY. IFN-ALPHAII SUBFAMILY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostoml;
Mammalia; Eutheria; Cetartiodactyla; Ruminantia; Pecora; Cervoidea;
Cervidae; Cervinae; Cervus.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       MEDIAGE-99081096; PubMed-9865498;
Martal J.L., Chene N.M., Huynh L.P., L'Haridon R.M., Reinaud P.B., Guillomot M.W., Charlier M.A., Charpigny S.Y.;
IFN-tau: a novel subtype I IFNI. Structural characteristics, non-ubiquitous expression, structure-function relationships, a pregnancy hormonal embryonic signal and cross-species therapeutic
40 LLGQMRRISPFS-------CLKDRNDFGFPQEVFDGNQFRKPQALSAVHETIQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           potentialities.";
Blochimie 80:755-777(1998).
-1- FUNCTION: PARACRINE HORMONE PRIMARLY RESPONSIBLE FOR MATERNAL
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   MEDINE-99273269; PubMed-10341723; Denmers K.J., Kaluz S., Deakin D.W., Jabbour H.N., Flint A.P.F.; "Production of interferon by the conceptus in red deer Cervus
                                                                                                                                                                                                                                                                                                                                               195 AA.
                                                                                                                                                                                             125 YYGRILHYLKAKEYSHCAWTIVRVEILRNF 154
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       Reprod. Fertil. 115:59-65(1999).
                                                                                                                                                                                                                                                                                                                                                                                          30-MAY-2000 (Rel. 39, Created)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               Cervus elaphus (Red deer)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              SEQUENCE FROM N.A.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              NCBI_TaxID=9860;
                                                                                                                                                                                                                                                                                                                                            INT_CEREL
046633;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                elaphus.
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SIGNAL
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                                                                                                                                                                                                                                                                                                  Matches
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         This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bloinformatics and the EMBL outstation-the European Bloinformatics Institute. There are no restrictions on its use by non-profit institutions as long as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/or send an email to license@ib-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                This SWISS-PROT entry is copyright. It is produced through a collaboration between the Swiss Institute of Bioinformatics and the EMBL outstation-the European Bioinformatics Institute. There are no restrictions on its use by non-profit institutions as along as its content is in no way modified and this statement is not removed. Usage by and for commercial entities requires a license agreement (See http://www.isb-sib.ch/announce/
                                                                                                                                                                                                                                                                                                                                                                    5
                                                                                                                                                                                                                                                                                                                                                                                                                                                   77 TGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKAK 136
                                                                                                                                                                                                                                                                                                                                                                                                                                                                 Gaps
                                                                                                                                                                                                                                                                                                                                                                                             19 KLLWQLNGRL--EYCLKDRMNFDIPEEIKQLQnFsKEDAALTIYEMLQNIFAIFRQDSSS 76
                                                                                                                                                                                                                                                                                                                                                                                                                         97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                HImmler A., Hauptmann R., Adolf G.R., Swetly P.;
"Molecular cloning and expression in Escherichia coli of equine type
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Mammalia; Eutheria; Perissodactyla; Equidae; Equus.
                                                                                                                                                                                                                                                                                                                                                                    3;
                                                                                                                                                                                                                                                                                                                                        29.2%; Score 255.5; DB 1; Length 195; 37.6%; Pred. No. 1.5e-14; live 33; Mismatches 57; Indels 3
                                                                                                                                                                                                                                                                                     r SIMILARITY.
F5304ACB1ACF0CC7 CRC64;
                                                                                                                                                                                                            PROSITE: PSOCO52; INTERFERON_A_B_D; 1.
Pregnancy: Cytokine; Hormone; Antiviral; Signal.
SIGNAL 1 23 BY SIMILARITY.
CHAIN 24 195 INTERFERON TAU.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           13-AUG-1987 (Rel. 05, Created)
13-AUG-1987 (Rel. 05, Last sequence update)
01-MAR-1989 (Rel. 10, Last annotation update)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      184 AA
                                                                                                                                                                                                                                                                      BY SIMILARITY.
BY SIMILARITY.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       EYSHCAWTIVRVEILRNFYFINRLTGYLR 165
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     ||| ||| ||| ||| ||| ||| ||| ||| ||| EYSDCAWEIVQVEMMRALSSISRLQKRLR 186
                                                                                                                                 HSSP; P01563; ZHIE.
InterPro; IPR000471; Interferon_abd.
Pfam; PF00143; interferon; 1.
PRINYS; PR00266; INTERFERONAB.
Procom; PD000550; Interferon_abd; 1.
SWART; SM00076; IRabd; 1.
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      PRT;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     SEQUENCE FROM N.A.
MEDLINE-87053170; PubMed-3022999;
                                                                                                                    EMBL; AJ000638; CAA04193.1; -.
                                                                                                                                                                                                                                                                                                 22075 MW;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    Interferon alpha-2 precursor.
Equus caballus (Horse).
                                                                                                                                                                                                                                                                                                                         STANDARD;
                                                                                                                                                                                                                                                         24 1
24 1
52 1
195 AA;
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   INA2_HORSE
P05004;
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           FAMILY
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65 NIFAJFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKR 124
                                                                                                                                                                                                                                                                                                                                                                                                                                                               Gaps
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               40 LLGQMRRISPFS------CLKDRNDFGFPQEVFDGNQFRKPQAISAVHETIQ
                                                                                                                                                                                                                                                                                                                                                                                                                                                               14;
                                                                                                                                                                                                                                                                                                                                                                                                                      Length 184;
                                                                                                                                                                                                                                                                                                            BY SIMILARITY.

BY SIMILARITY.

FC15DC7D811C68EC CRC64;
                                                                                                                                                                                                                                                                                                                                                                                                                                                               55;
                                                                                                                                                                                                                                                                                           INTERFERON ALPHA-2
                                                                                                                                                                                                                                                                                                                                                                                                                 28.9%; Score 253; DB 1; 36.0%; Pred. No. 2.3e-14; iive 27; Mismatches 55
                                                                                                                                                                                                                          PROSITE; PS00252; INTERFERON_A_B_D; 1.
Cytokine; Antiviral; Multigene family; Signal.
or send an email to license@isb-sib.ch).
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  125 YYGRILHYLKAKEYSHCAWTIVRVEILRNF 154
                                                                           PIR; B24912; IVH0A2.
HSSP; P01563; ZHIE.
INTERPRO; IPR000471; Interferon_abd.
PFan; PF00143; interferon; 1.
PRINTS; PR00266; INTERFERONAB.
PRODOM; P0000550; Interferon_abd; 1.
                                                                                                                                                                                                                                                                                                                                                       20877 MW;
                            EMBL; M14541; AAA30950.1; -.
                                                                                                                                                                                                                                                                                                                                                                                                                                                             54; Conservative
                                                                                                                                                                                                           SM00076; IFabd; 1.
                                                                                                                                                                                                                                                                                                                                                       184 AA;
                                                                                                                                                                                                                                                                                                                                                                                                                                       Best Local Similarity
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DISULFID
SEQUENCE
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Search completed: July 29, 2002, 15:45:11 Job time: 187 sec